

# THE JOURNAL OF MEDICAL EDUCATION

OFFICIAL PUBLICATION OF  
THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES



APRIL 1961 • VOLUME 36 • NUMBER 4

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By JULES H. MASSEMAN, M.D., Professor of Neurology and Psychiatry, Northwestern University, and Director of Education, Illinois State Psychiatric Institute, Chicago. About 352 pages, 6" x 9 $\frac{1}{4}$ ", illustrated. About \$8.00.

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the written text to the highest degree of excellence. This is not an abridgement of the larger book, *Dermatology*, by the same authors, but is a completely rewritten shorter work.

By DONALD M. PILLSBURY, M.A., D.Sc. (Hon.), M.D., F.A.C.P., Professor and Director of Department of Dermatology, University of Pennsylvania School of Medicine; WALTER B. SHELLEY, M.D., Ph.D., F.A.C.P., Professor of Dermatology, University of Pennsylvania; and ALBERT M. KLIGMAN, M.D., Ph.D., Professor of Dermatology, University of Pennsylvania. About 496 pages, 6 $\frac{1}{4}$ " x 9 $\frac{1}{4}$ ", with about 234 illustrations. About \$10.00.

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*Manuscripts* should be submitted in duplicate. All manuscripts are reviewed by the Editorial Board before acceptance for publication. All copy, including footnotes, tables, and legends, should be typed double-spaced. Each diagram or graph or photograph should have a brief legend. Each table should be typed on a separate sheet of paper. References should refer to published material only, must be submitted in alphabetical order, and should include, in order: author, title, journal abbreviation (*Quarterly Cumulative Index Medicus* form), volume number, page, and year; book references should also include editors, edition, publisher, and place of publication.

*Galley proofs* will be mailed to authors for correction before publication and should be returned within 48 hours after receipt.

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*Medical Education Forum* includes editorials, letters, comments, criticisms, and excerpts from important addresses.

*News from the Medical Schools:* Material for this section should be transmitted to the News Editor, Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois. Announcements of major faculty and administrative appointments, news of distinguished visitors and significant educational developments will be included. It is not possible to publish notices on grants-in-aid for scientific research.

*Items of Current Interest:* Audio-visual news and notices from national and federal agencies appear in this section.

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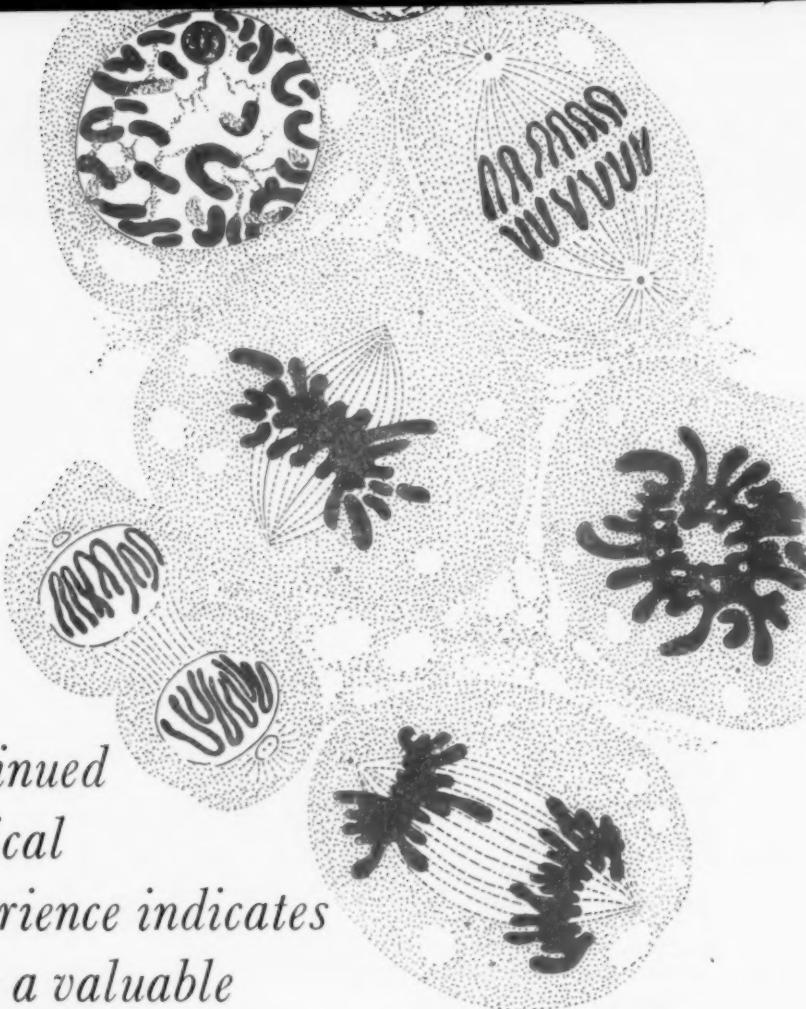
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Address all correspondence concerning reprints, subscriptions, change of address, and back numbers to the Business Office, Association of American Medical Colleges, 2530 Ridge Ave., Evanston, Ill. All changes of address should provide both the old and the new address.

Address all correspondence concerning news, announcements, and personnel exchange to the office of the Association of American Medical Colleges, c/o Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois; address all correspondence concerning advertising to Miss Helen Claire Herman, 2530 Ridge Avenue, Evanston, Illinois.

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BLAINE & McARTHUR	<b>By Graham B. Blaine, Jr. And Charles C. McArthur</b>
<b>EMOTIONAL PROBLEMS OF THE STUDENT</b>	Harvard University Health Service
(New Book—1961)	The authors and 12 collaborators discuss the increasingly serious problems of character, emotion and adjustment faced by students who are largely in their adolescent year; and present methods for management and treatment. The many case histories included are from the files of various schools. This is a practical book for the use of all school personnel concerned with the counselling and guidance of students.
March 1961    274 Pages    Case Histories    \$4.95	
<b>LEVINE'S CARDIAC EMERGENCIES AND RELATED DISORDERS</b>	<b>By Harold D. Levine, M.D.</b>
(New Book—1960)	Harvard Medical College, Boston
This book presents distinct plans of therapy and their mode of action in 17 chapters covering: Acute left ventricular failure; Cardiac shock; Cardiogenic chest pain; Pulmonary embolism and infarction; Refractory congestive failure; Electrolyte disturbances as cardiovascular emergencies; Digitalis intoxication; Atrial flutter, tachycardia with block, and fibrillation; Paroxysmal ventricular tachycardia; Adams-Stokes disease; Syncope; Cardiac arrest; Miscellaneous emergencies.	
1960    368 Pages    47 Illus.    \$12.00	
<b>GRACE'S PRACTICAL CLINICAL MANAGEMENT OF ELECTROLYTE DISORDERS</b>	<b>By William J. Grace, M.D.</b>
(New Book—July 1960)	Prof. of Clin. Medicine, N. Y. University
This small book is a guide to the bedside clinical management of electrolyte problems. It describes the clinical syndromes of electrolyte disturbances, briefly explains the mechanisms involved and specifies what can be done to correct them. In this respect it differs from other texts which are physiologically and chemically oriented and is therefore of practical usefulness to students, house officers and physicians. Illustrative case reports supplement the text.	
July 1960    144 Pages    11 Illus.    \$4.95	
<b>HYMAN'S ACUTE MEDICAL SYNDROMES AND EMERGENCIES</b>	<b>By Albert S. Hyman, M.D., et al.</b>
(New Book—1959)	New York Medical College, N.Y.C.
A quick reference book dealing primarily with acute problems involving the heart, the gastrointestinal tract, the chest and the lungs. Relatively less space is given to diabetic and renal emergencies and to barbiturate poisoning. Common problems of diagnosis and treatment are covered in detail when clinically important. Where life and death issues are involved in prompt and correct diagnosis and treatment, the authors spare no effort to clarify each problem.	
1959    442 Pages    7 Illus.    \$8.75	
<b>VIGNEC'S EMERGENCY SYNDROMES IN PEDIATRIC PRACTICE</b>	<b>By Alfred J. Vignec, M.D.</b>
(New Book—1959)	N.Y. University College of Medicine
The head of the largest pediatric in-patient service in the United States presents concrete assistance for handling the day-to-day emergencies of pediatric practice with common-sense, definitive, tested therapy. Separate chapters cover respiratory, gastrointestinal, hematopoietic, metabolic, cardiovascular, and central nervous system disorders, the steroids, poisons, allergy and the prematures. These therapies will help you to initiate immediate, vigorous and effective measures.	
1959    382 Pages    14 Illus.    9.00	
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\*Papac, R.; Petrakis, N. L.; Amini, F., and Wood, D. A.: J.A.M.A. 172:1387-1391 (March 26) 1960.

**DOSAGE: For neoplasms relatively susceptible to Cytoxan** — Patients with lymphomas and other neoplasms believed to be relatively susceptible to Cytoxan therapy are given an initial dose of 2-3 mg./Kg./day intravenously. White blood counts and platelet determinations should be made daily or twice weekly and the dosage adjusted accordingly. Intravenous infusions should be continued for at least 6 days unless otherwise indicated. A leukopenia of between 1500 and 5000 cells per cu. mm. (or lower) may be expected between the tenth and fourteenth day. In the presence of a leukopenia of less than 2000/cu. mm. Cytoxan should be discontinued until the white cell count returns to 2000 to 5000 (usually within a week). Dosage is subsequently adjusted as indicated by the patient's objective response and the leukocyte count. If the patient is subjectively improved, if the size of the tumor has decreased, or if the white cells are satisfactorily maintained between 2000 and 5000/cu. mm. oral dosage may be instituted equivalent to intravenous dosage.

Thrombocytopenia is rarely observed on this regimen. If platelet counts of less than 100,000/cu. mm. are observed, the patient should be watched carefully. If platelets continue to decrease, Cytoxan should be discontinued.

The patient who has had previous treatment with alkylating agents, or x-ray, or is debilitated may be more susceptible to bone marrow depression, and initial Cytoxan doses should be more conservative than the above. Such patients should have more frequent hematologic evaluation. Good medical practice demands access to a reliable hematologic laboratory when using Cytoxan.

**For neoplasms relatively resistant to Cytoxan** — Patients with carcinomas and other malignant neoplasms believed to be less susceptible to Cytoxan therapy are given a dose of 4 to 8 mg./Kg./day intravenously. Unless there are indications to the contrary, this dose is continued for 6 days, then stopped. Leukopenia usually ensues on the tenth to fourteenth day after the first dose of Cytoxan. Thrombocyte reduction is not common, and platelets may actually increase. The leukocyte count promptly returns toward normal levels in most cases, and as it begins to increase, sufficient Cytoxan is administered to maintain it near 2000 to 5000/cu. mm. This may be accomplished by two intravenous injections weekly, or by oral administration, or by a combination of both routes. An oral dosage of 50 to 200 mg. daily or an intravenous injection of 5 mg./Kg. twice weekly will usually suffice.

The platelet and leukocyte counts should be followed carefully, and the prior treatment history of patients carefully evaluated as delineated above.

**Leukopenia as a guide to adequacy of dosage** — The best objective measure for dosage seems to be the number of circulating white blood cells. This is used as an index of the activity of the hematopoietic system, especially the bone marrow. The mechanism by which Cytoxan causes a reduction in the level of white blood cells is not known, but cessation of dosage results in an increase in the level, indicating that the hematopoietic system had not been permanently affected. When large doses (8 mg./Kg./day for 6 days) are given initially, the white cell count falls rapidly. Following the cessation of the 6-day course, the white cells may continue to decline for as long as 8 days and then increase. The reduction of the white cell count during Cytoxan therapy and its subsequent increase when therapy is discontinued can be repeated in the same patient. Maximal reduction in leukocyte count indicates the maximal permissible Cytoxan level for therapeutic effect. Leukopenic patients must be watched carefully for evidence of infection.

Total white blood cell and thrombocyte counts should be obtained 2 or more times weekly in order to evaluate therapy and to adjust dosage.

**SIDE EFFECTS:** Although Cytoxan is related to nitrogen mustard, it has no vesicant effect on tissue. It does not traumatize the vein when injected intravenously, nor does it cause any localized tissue reaction following extravasation. It may be administered intravenously, intramus-

cularly, intraperitoneally, intrapleurally or directly into the tumor, when indicated. It is apparently active by each of these routes.

Nausea and vomiting are common and depend on dose and on individual susceptibility. However, many investigators accept the nausea and vomiting in favor of maintaining maximal therapy. The vomiting can be controlled with antiemetic agents.

Alopecia is a frequent side reaction to Cytoxan therapy. It has been observed in 28% of the patients studied in this country. The incidence is greater with larger doses. The loss of hair may first be noted about the 21st day of therapy and may proceed to alopecia totalis. This effect is reversed following discontinuance of Cytoxan; during reduced maintenance therapy, hair may reappear. It is essential to advise the patient in advance concerning this effect of the drug.

Dizziness of short duration and of minor degree has occasionally been reported.

Leukopenia is an expected effect and can be used as a guide to therapy. Thrombocytopenia may occur, especially after large doses. The leukocyte or platelet counts of an occasional patient may fall precipitously after even small doses of Cytoxan, as with all alkylating agents. The drug should be discontinued in such patients and reinstated later at lower dosage after satisfactory hematologic recovery has occurred. Prior treatment with x-ray or with other chemotherapeutic agents frequently causes an earlier or exaggerated leukopenia or thrombocytopenia after Cytoxan medication. Only rarely has there been a report of erythrocyte or hemoglobin reduction.

**ADMINISTRATION:** Add 5 cc. sterile water (Water for Injection, U.S.P.) to 100 mg. of Cytoxan in the sterile vial (add 10 cc. to 200 mg. vial). Shake, allow to stand until clear, remove with sterile syringe and needle and inject.

The freshly prepared solution of Cytoxan may be administered intravenously, intramuscularly, intraperitoneally, intrapleurally, or directly into the tumor. The solution should be administered promptly after being made but is satisfactory for use for three hours after preparation.

If the patient is receiving a parenteral infusion, the Cytoxan solution may be injected into the rubber tubing if the solution is glucose or saline.

No thrombosis or thrombophlebitis has been reported from injections of Cytoxan. Extravasation of the drug into the subcutaneous tissues does not result in local reactions.

**PRECAUTIONS:** Cytoxan should not be given to any person with a severe leukopenia, thrombocytopenia, or bone marrow infiltrated with malignant cells. It may be given with suitable precautions to patients who have had recent x-ray treatment, recent treatment with a cytotoxic agent, a surgical procedure within 2-3 weeks, or debilitated patients.

**AVAILABILITY:** Cytoxan is available as follows:

Cytoxan for Injection, 100 mg., a sterile dry-filled vial containing 100 mg. cyclophosphamide and 45 mg. sodium chloride. Packaged, 12 vials per carton.

Cytoxan for Injection, 200 mg., a sterile dry-filled vial containing 200 mg. cyclophosphamide and 90 mg. sodium chloride. Packaged, 12 vials per carton.

Cytoxan Tablets for oral administration, 50 mg., white, round tablets, flecked with blue for easy identification. Packaged, 100 tablets per bottle.

For a copy of the Cytoxan brochure, or other additional information on Cytoxan, communicate directly with the Medical Department (Section A), Mead Johnson Laboratories, Evansville 21, Indiana.



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## Calendar of Meetings

### ASSOCIATION OF AMERICAN MEDICAL COLLEGES

72nd Annual Meeting, Nov. 13-15, 1961

Queen Elizabeth Hotel, Montreal, Canada

### 1961

#### APRIL

AEROSPACE MEDICAL ASSOCIATION (32nd annual meeting), Chicago, Apr. 24-26. Dr. Willion J. Kennard, c/o Washington National Airport, Washington, D.C., Secretary-Treasurer.

AMERICAN ACADEMY OF GENERAL PRACTICE, Miami Beach, Fla., Apr. 13-20. Mr. Mac F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Mo., Executive Director.

AMERICAN ACADEMY OF NEUROLOGY (members and guests), Sheraton-Cadillac Hotel, Detroit, Apr. 27-29. Mrs. J. C. McKinley, 4307 E. 50th St., Minneapolis 17, Executive Secretary.

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS, Chicago, April 26-28. For information write: The Intersociety Committee on Pathology Information, 1785 Massachusetts Ave., N. W., Washington 6, D. C.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Sheraton Hotel, Philadelphia, Apr. 24-26. Dr. Hiram T. Langston, 308 Carondelet Bldg., 7730 Carondelet Ave., St. Louis 5, Secretary.

AMERICAN COLLEGE HEALTH ASSOCIATION, Detroit, Apr. 26-29. Dr. Norman S. Moore, Cornell University, Gannett Clinic, Ithaca, N.Y., Secretary-Treasurer.

AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS, Americana Hotel, Miami Beach, Fla., Apr. 21-28. Mr. Donald F. Richardson, 79 W. Monroe St., Chicago 3, Executive Secretary.

AMERICAN FEDERATION FOR CLINICAL RESEARCH, Haddon Hall, Atlantic City, Apr. 30. James E. Bryan, 250 W. 57th St., New York 19, Executive Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, INC., Chalfonte-Haddon Hall, Atlantic City, Apr. 29-30. Joan K. Erpf, 265 Nassau Rd., Roosevelt, N.Y., Executive Assistant.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS, Barbizon-Plaza, New York City, Apr. 17-20. Dr. Edward C. Hinds, P.O. Box 20068, Houston 25, Texas, Secretary-Treasurer.

#### MAY

AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS (for members and invited guests), Del Monte Lodge, Pebble Beach, Calif., May 10-12. Dr. William J. Engel, Cleveland Clinic, 2020 E. 93rd St., Cleveland 6, Ohio, Secretary-Treasurer.

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE, Shoreland Hotel, Chicago, May 18-20. Dr. John B. Blake, c/o Smithsonian Institution, Washington 25, D. C., Secretary-Treasurer.

AMERICAN COLLEGE OF CARDIOLOGY, INC., Biltmore Hotel, May 16-20. Dr. Philip Reichert, 350 Fifth Ave., Empire State Bldg., New York 1, Executive Director.

AMERICAN COLLEGE OF PHYSICIANS, Americana Hotel, Miami Beach, Fla., May 8-12. Dr. Edward C. Roseman Jr., 4200 Pine St., Philadelphia 4, Executive Director.

AMERICAN GASTROENTEROLOGICAL ASSOCIATION, Drake Hotel, Chicago, May 25-27. Dr. Wade Wolwiler, Dept. of Med., Univ. of Washington, Seattle 5, Secretary.

AMERICAN ORTHOPAEDIC ASSOCIATION (members and guests), The Ahwahnee, Yosemite, Calif., May 22-25. Dr. Lee Ramsay Straub, 535 E. 70th St., New York 21, Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Morrison Hotel, Chicago, May 8-12. Dr. C. H. Hardin Branch, 186 Westminster Ave., Salt Lake City 15, Utah, Secretary.

AMERICAN SOCIETY OF INTERNAL MEDICINE, Eden Roc Hotel, Miami Beach, Fla., May 5-7. Mr. G. Tod Bates, 350 Post St., San Francisco 8, Executive Director.

AMERICAN UROLOGICAL ASSOCIATION, INC., Biltmore Hotel, Los Angeles, May 22-25. Mr. William P. Didusch, 1120 N. Charles St., Baltimore 1, Executive Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS, Chalfonte-Haddon Hall, Atlantic City, May 2-3. Dr. Paul B. Beeson, Yale University School of Medicine, New Haven 11, Conn., Secretary.

STUDENT AMERICAN MEDICAL ASSOCIATION, Congress, Chicago, May 3-7. Mr. Russell F. Staudacher, 430 N. Michigan Ave., Chicago 11, Executive Director.

#### JUNE

AMERICAN COLLEGE OF ANGIOLOGY, Savoy-Hilton Hotel, New York City, June 23-25. Alfred Halpern, Ph.D., 11 Hampton Court, Great Neck, N. Y., Secretary.

AMERICAN COLLEGE OF CHEST PHYSICIANS, Hotel Commodore, New York City, June 22-26. Mr. Murray Kornfeld, 112 E. Chestnut St., Chicago, Executive Director.

AMERICAN DERMATOLOGICAL ASSOCIATION, INC. (members only), Castle Harbour Hotel, Tucker's Town, Bermuda, June 16-20. Dr. Wiley M. Sams, 25 S. E. Second Ave., Miami 32, Fla., Secretary.

AMERICAN MEDICAL ASSOCIATION, ANNUAL MEETING, New York City, June 25-30. Dr. F. J. L. Blasingame, 535 N. Dearborn, Chicago 10, Executive Vice-President.

AMERICAN NEUROLOGICAL ASSOCIATION, Hotel Claridge, Atlantic City, June 12-14. Dr. Melvin D. Yahr, Neurological Institute, 710 W. 168th St., New York 32, Executive Secretary.

SOCIETY OF NUCLEAR MEDICINE, Penn Sheraton Hotel, Pittsburgh, June 14-17. Mr. Samuel N. Turiel, 430 N. Michigan Ave., Chicago 11, Executive Administrator.

#### JULY

INTERNATIONAL COLLEGE OF SURGEONS, NEW ENGLAND REGIONAL MEETING, Chatham Bars Inn, Chatham, Cape Cod, Mass., July 1-4. Dr. M. Leopold Brodny, 4646 N. Marine Dr., Chicago 40, Treasurer.

#### AUGUST

AMERICAN CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION, Sheraton-Cleveland Hotel, Cleveland, Aug. 27-Sept. 1. Dorothea C. Augustin, 30 N. Michigan Ave., Chicago 2, Executive Secretary.

NATIONAL MEDICAL ASSOCIATION, INC., Commodore Hotel, New York City, Aug. 7-10. Dr. John Givens, 1108 Church St., Norfolk, Va., Executive Secretary.

New 1961 Book

## Hubbard and Clemans—Multiple-Choice Examinations in Medicine

*A Guide for Examiner and Examinee*

By JOHN P. HUBBARD, M.D.

Professor of Public Health and Preventive Medicine,  
University of Pennsylvania Medical School;  
Executive Secretary, National Board of Medical Examiners

and WILLIAM V. CLEMANS, Ph.D.

Director of Testing Services, National Board of  
Medical Examiners, Philadelphia

This *new book* presents a clear understanding of the characteristics of multiple-choice examinations, with special emphasis on medical knowledge. General problems of measuring knowledge are discussed, including consideration of the relative merits of essay and multiple-choice methods. Construction and analysis of individual questions and of the examinations as a whole are taken up in detail. Methods of interpreting results are suggested. There is a sample test of 170 questions in the *Appendix*.

New. 186 Pages. \$3.75

New 1961 Editions

## Buchanan—Functional Neuro-Anatomy

By A. R. BUCHANAN, M.D.

Professor and Head of the Department of Anatomy,  
University of Colorado School of Medicine, Denver

A re-arrangement of chapter order for this *new edition* brings into better focus inter-relationships between the "pyramidal" and "extrapyramidal" motor systems as they affect motor disabilities. New material is added to the discussion of the basal ganglia, and a descriptive orientation to the thalamus is included with the hypothalamus.

New 4th Ed. 377 Pages, 7" x 10". 273 Illus., 18 in Color. \$8.50

## Boyd—A Textbook of Pathology

By WILLIAM BOYD, M.D.

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carrying a glass globe affixed with two glass nipples and filled with nitrous oxide. He was William Morton, a dentist; he had been delayed making last-minute adjustments in his equipment.

He inserted one nipple between the patient's lips and told him to breathe deeply. Soon the lips parted, the patient's eyes closed and his head fell to one side. "Sir, your patient is ready." Warren made the first incision—the patient did not stir. Astounded, Warren continued. There was utter silence in the hall as he scraped out the tumor, applied a ligature and stanchéd the bleeding. As he finished, just for a moment there were unguarded tears in his eyes, and he broke the silence with the words, "Gentlemen, this is no humbug."

—JURGEN THORWALD: *The Century of the Surgeon*, New York, Pantheon Books Inc., 1957, pp. 105-111.



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# *The Journal of MEDICAL EDUCATION*

VOLUME 36 • NUMBER 4 • APRIL, 1961

## The Study of Applicants, 1959-60

EDWIN B. HUTCHINS, PH.D.,\* and HELEN HOFER GEE, PH.D.†

Association of American Medical Colleges,  
Evanston, Illinois

... the medical selection committees never get the first choice. The first choice is made by the boy himself; sometimes he chooses medicine, sometimes something else, for medicine is in competition with other fields that are also interested in the good prospects from the growing generation of bright youngsters. (6)

For the student contemplating the question of career choice, medicine is yielding its once preferred position among the professions. This realization, along with recent reports stressing future medical manpower needs (1,2), suggests that those concerned with the recruitment and selection of medical students should critically evaluate all data that might illuminate past and future trends in applicant activity. For this reason the 1959-60 applicant study has an expanded appendix reinstituting some of the types of data dropped from the last few studies. In addition, an attempt has been made to utilize other sources for information that is pertinent to medicine's position in the over-all search for talent.

The purpose of this report is to: (a) describe some of the variability in applicant activity in recent years; (b) present

information relevant to more stable long-term trends; (c) broaden the outlook on medicine's recruitment program by considering losses in the talent supply through factors in admissions procedures, as well as losses due to financial reasons and competition with other manpower needs.

### SHORT-TERM TRENDS

For the third consecutive year the number of individuals applying to United States medical schools has decreased. The total number of applicants to the 1959-60 class was 6 per cent less than the total number applying in 1956-57. The total number of applications filed by these students exhibited a similar decrease, but the over-all number of acceptances increased slightly (up 3 per cent over 1956-57), thereby accentuating the trend toward a more stringent applicant situation. Table 1 presents the data for 1959-60 and for the previous 12 years.

As for the intellectual characteristics of 1959-60 applicants as measured by the Medical College Admission Test (MCAT), average Science Achievement scores have increased even further than in 1958-59 from the low set by the 1957-58 group. Scores on the Quantitative section were down slightly from the high achieved by 1958-59 applicants, but the

\* Research Associate.

† Director of Research.

TABLE 1  
SUMMARY OF APPLICATION ACTIVITY DURING THE PAST 13 YEARS

1st year class	Appli- cants	APPLICATIONS TO MEDICAL SCHOOLS			UNDERGRADUATE COLLEGES	
		Total	Per in- dividual	Accepted applicants	1st level degrees granted (Men only)	Students under G.I. Bill
1945-46					58,945	87,805
1946-47					110,500	1,012,400
1947-48	18,829	56,279	3.0	6,512	176,146	1,149,941
1948-49	24,242	81,662	3.4	6,973	264,222	974,945
1949-50	24,434	88,244	3.6	7,150	329,819	843,677
1950-51	22,279	81,931	3.7	7,254	279,343	580,597
1951-52	19,920	70,678	3.5	7,663	227,029	396,186
1952-53	16,763	56,319	3.4	7,778	200,820	266,650
1953-54	14,678	48,586	3.3	7,756	187,500	280,264
1954-55	14,538	47,568	3.3	7,878	183,602	364,645
1955-56	14,937	54,161	3.6	7,969	199,571	450,880
1956-57	15,917	59,798	3.8	8,263	222,738	474,657
1957-58	15,791	60,951	3.9	8,302	242,948	446,348
1958-59	15,170	59,102	3.9	8,366	257,000	380,271
1959-60	14,952	57,888	3.9	8,512		

1959-60 applicants were the first to surpass the 1951-52 standardization group in over-all MCAT performance. Table 2 presents mean MCAT scores from 1952-53 to the present, 1951-52 being the year the present norms were established (i.e., MCAT scores were standardized with means of 500).

Over this 8-year period, fluctuations in MCAT scores of accepted applicants have not been striking; admissions committees continue by and large to select the best of the applicants that come to them and have been able thus far to maintain the intellectual ability of their entering classes at a relatively high level. The superiority of the accepted applicant group is clearly indicated in Table 3, where an additional breakdown is made between first-time and repeat applicants. A categorical relationship can be observed between acceptance and ability level, in which the accepted first-time applicants have the highest MCAT scores and those accepted this year but rejected in previous years have the next highest. Applicants applying for the first time in 1959-60 who were not accepted score lower than either of these groups, and those who have been rejected more than once have the lowest MCAT scores. To

further illustrate differences between accepted and rejected applicants an expectancy chart is presented in Table 4 indicating the proportions of 1959-60 applicants at various levels of ability who were accepted and rejected.

An often cited criterion of quality is the proportion of accepted applicants who have "A" undergraduate grade averages. During the past year statements appearing in the public press have overemphasized evidence suggesting a decline in quality of medical students as measured by this criterion. Although it is true that the proportion of "A" students has declined from a high set in 1950 and 1951, it must be remembered that these were the years in which the ratios of applicants to acceptances were also extremely high, and that these high ratios occurred as a function of the influx of veterans to higher education. Since 1952 the distribution of grades among accepted applicants has remained relatively constant, with no indication of significant decline (see Table 5).

The medical schools appear, then, to have held their own during the past 8 years in terms of the quality of accepted candidates if not in terms of absolute numbers applying.

TABLE 2  
MEAN MCAT SCORES OF ACCEPTED AND REJECTED APPLICANTS DURING THE PAST 8 YEARS

YEAR	ACCEPTED APPLICANTS			REJECTED APPLICANTS			TOTAL APPLICANTS			Grand total N	
	VA	QA	MS	Sci	Total N	VA	QA	MS	Sci		
1952-53	522	526	519	525	7,346	7,778	465	459	467	457	7,298
1953-54	519	525	524	530	7,426	7,756	461	457	472	460	5,801
1954-55	517	521	521	530	533	7,527	7,876	457	455	473	459
1955-56	524	528	527	522	7,688	7,969	466	459	476	454	6,651*
1956-57	525	525	519	519	8,012	8,263	463	458	473	445	6,859
1957-58	528	517	527	516	8,223	8,302	467	452	472	442	6,840
1958-59	527	532	520	523	8,301	8,366	461	456	467	441	6,305
1959-60	529	527	527	527	8,449	8,512	470	455	473	449	6,019

\* Estimated

Whether the present level of quality can be maintained in the face of a shrinking applicant pool will probably be contingent upon two major considerations: (a) the competition between medicine and other fields for the available talent supply and (b) the importance of financial problems in career choice.

#### COMPETITION FOR TALENT SUPPLY

Medicine has entered a period of intense competition with other fields for sufficient talent to meet the challenges set forth in the Bane report (1). Data showing the growth of medical school enrollments relative to those in other fields of graduate education are presented in Table 6. Any discussion of the optimum per cent increase in the number of students enrolled in medical school can and should be based on consideration of such factors as projected population increases and the physician-population ratio to be maintained. Nevertheless, the data in Table 6 are important when we consider that rapidly increasing enrollments in sciences other than medicine are drawing upon a finite supply of talented youth. Even though the 7 per cent increase in enrollments that medicine experienced over the last few years may approach adequacy in terms of absolute projected needs (and this assumption is currently being debated in all circles interested in medical education), it becomes necessary to consider the inroads that increased enrollments in other graduate curricula will eventually make on the available talent supply, both in terms of quality and quantity of applicants. The aggregate increase in graduate level enrollments in all other fields over the last 6 years has been 9 times the per cent increase in medical school enrollments for the same period. The discrepancy provides testimony that the educational support essential for the relative growth of the medical profession has not been provided.

TABLE 3  
MCAT SCORES COMPARED BY ACCEPTED VS. REJECTED AND FIRST-TIME APPLICANTS VS.  
REPEATERS APPLYING TO THE 1959-60 ENTERING CLASS

	VA	QA	MS	Sci	No. individuals taking MCAT
One or more acceptances:					
First-time applicants	532	530	530	531	7,274
Repeaters	506	505	508	498	1,175
Rejected applicants:					
First-time applicants	471	456	475	449	4,384
Repeaters	466	452	469	447	1,635
Average for all applicants taking MCAT:	504	497	505	494	14,468

#### FINANCIAL CONSIDERATIONS

Chart 1 graphically presents trends in medical school application activity in relation to the number of students engaged in higher education under the auspices of the G.I. Bill and in relation to the total number of bachelors and first professional degrees conferred each year since 1945. The similar shapes of the medical school applicant and G.I. Bill curves suggest the possibility that available funds may play an important role in decisions concerning advanced education beyond the A.B. degree. A recent survey of the 1959 fourth-year medical school class by the AAMC's Division of Operational Studies indicates that at that time veterans' benefits accounted over-all for only about 4 per cent of medical students' income. This information is consistent with the obvious correlation between the number of veterans in train-

ing and the degree of applicant activity.

As the National Defense Education Act of 1958 becomes increasingly implemented, it is conceivable that it will fill the economic void left by the retirement of the G.I. Bill and that a corollary increase in applicant activity will ensue. At least two factors militate against this possibility, however. First, monies available under this act are in the form of loans, which may make them less attractive to the student who contemplates extending his academic career than was the outright grant under veterans' training. This might be especially true when the student has already burdened himself financially during the period of his undergraduate education. Second, these funds are matching funds requiring an outlay on the part of the medical college which in many cases cannot realistically be met in any large amount. The AAMC

TABLE 4  
EXPECTANCY CHART FOR ACCEPTANCE TO U.S. MEDICAL SCHOOLS BASED ON MEDICAL  
COLLEGE ADMISSION TEST SCORES OF 1959-60 APPLICANTS

IF MCAT SCORE IS BETWEEN:	CHANCES IN 100 OF BEING ACCEPTED ARE:				CHANCES IN 100 OF BEING REJECTED ARE:			
	VA	QA	MS	Sci	VA	QA	MS	Sci
700-799	82	92	78	89	18	8	22	11
600-699	78	82	76	83	22	18	24	17
500-599	68	70	67	73	32	30	33	27
400-499	53	52	53	52	47	48	47	48
300-399	29	29	29	22	71	71	71	78
200-299	10	9	12	7	90	91	88	93

TABLE 5

## COMPARATIVE ANALYSIS OF COLLEGE RECORDS OF FIRST-YEAR MEDICAL STUDENTS\*

College Grade	UNITED STATES (PER CENT)									
	Average first-year medical schools	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59
3.6-4.0 (A)	40	30	18.0	21.1	16.8	15.8	16.1	17.7	16.0	15.1
2.6-3.5 (B)	43	55	67.5	68.9	69.0	70.6	69.9	66.0	69.7	70.0
1.0-2.5 (C)	17	15	14.5	10.0	14.2	13.6	14.0	16.3	14.3	14.9

\* Based on returns from 81 medical schools.

Teaching Institute report on "The Ecology of The Medical Student" (4) indicated, for example, that 40 per cent of all United States medical schools could not, during 1957, fulfill their students' needs for educational loans. In the past, financial factors were less likely to affect the relative drawing power of the various professions, since all were in similar situations competitively as far as cost and method of financing were concerned. More recently the availability of monies in the form of scholarships, fellowships, and teaching and research assistantships have made the financing of advanced schooling in many graduate departments

relatively more attractive than medicine. The "Datagram" in the January, 1961, issue of the *Journal of Medical Education* dramatically illustrates this point.

In summary, growth of the applicant pool available to medical school admissions committees shows an over-all increase of only 2 per cent from 1953-54 to 1959-60, with the trend for the last 3 years in the direction of fewer applicants. Over the same period the number of accepted applicants has increased almost 10 per cent (Table 1), while other fields competing for the same talent have grown much more rapidly. In broader perspective, however, the last 10-20

TABLE 6

## A COMPARISON OF MEDICAL SCHOOL ENROLLMENTS\* WITH GRADUATE ENROLLMENT IN 74 SCHOOLS FOR SELECTED SCIENCE FIELDS AND ALL OTHER FIELDS, 1953-54 AND 1959-60†

FIELD	GRADUATE ENROLLMENT		INCREASE	
	1953-54	1959-60	Number	Per cent
Medicine	28,227	30,084	1,857	7
Total, selected science fields	32,482	44,231	11,749	36
Biosciences	7,579	9,331	1,752	23
Mathematics and statistics	2,800	5,866	3,066	110
Physical sciences	11,874	15,904	4,030	34
Psychology	4,066	5,359	1,293	32
Selected social sciences‡	6,163	7,771	1,608	26
Total, all other fields §	75,722	127,274	51,552	68
Grand total, all fields	108,204	171,505	63,301	59

\* Medical School data based on 80 schools, 1953-54, and 85 schools in 1959-60.

† Data on fields other than medicine based on 74 leading academic institutions. Taken from "Trends in graduate enrollment in selected science fields at 74 leading schools, 1953-54 and 1959-60"—Resources Analysis Memo No. 2, Prepared by Resources Analysis Section, Office of Program Planning, National Institutes of Health (Washington, D. C.: U. S. Department of Health, Education, and Welfare) June, 1960, p. 2.

‡ Includes anthropology, sociology, and social work only.

§ Includes agricultural sciences, forestry, geography, general science programs, health professions, business administration, education, fine arts, humanities, law, etc.

years represent a relatively unstable base for future projections.

#### LONG-TERM TRENDS IN CHOICE OF A MEDICAL CAREER

We cannot look only at the absolute number of students entering medical schools, nor can we limit perusal of the data to the last few years if we are to understand the forces that are likely to be operative in future trends. A slow and consistent decline over a period of 150 years in the percentage of college graduates entering the practice of medicine is apparent in Table 7. A century

ago medicine, law, and the clergy constituted the intellectual community. Today competing occupations and professions draw 98 of every 100 college graduates, leaving only 2 per cent to medicine. This long-term trend is the inevitable outcome of the growth and application of new knowledge. Undergraduate college enrollments have kept pace with scientific development, but it must be recognized that the national talent supply is not infinite. Eventually the proportion of the population graduating from college will approach an asymptote. In addition, not all of the increasing

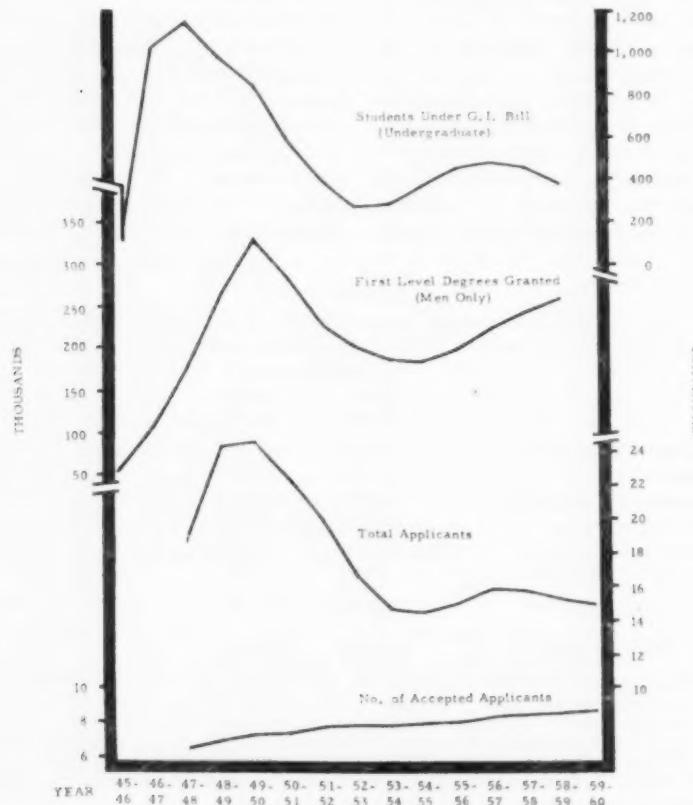


CHART 1.—Application Activity in Relation to Veterans in Training and First Level Degrees.

TABLE 7  
PERCENTAGE OF ALL COLLEGE GRADUATES  
WHO ENTERED PRACTICE OF MEDICINE,  
1801-1955\*

Period	Per Cent
1801-1820	28
1821-1840	35
1841-1860	28
1861-1880	28
1881-1900	21
1901-1905	19
1906-1910	14
1911-1915	10
1916-1920	7
1921-1925	5
1926-1930	4
1931-1935	4
1936-1940	3
1941-1945	3
1946-1950	2
1951-1955	2

\* Data for 1801-1900 from B. B. Burritt, *U. S. Bureau of Education Bulletin* 19, 1912, and for 1901-55 from Commission on Human Resources and Advanced Training. From Dael Wolfe, "The Appraisal of Applicants to Medical Schools," (Report of the Fourth Teaching Institute) Evanston, Illinois: Association of American Colleges, 1957.

number completing undergraduate education are or will be qualified for advanced study. In time, then, interest will focus in earnest on how the highly talented distribute themselves among the various occupational fields.

To illustrate the present-day limitations of the national talent pool we can begin with the criterion for national health services used by the Bane report, i.e., the physician-population ratio. The present quantity of medical services is based on a physician-population ratio of

one physician for every 753 people in the United States (1). Approximately one-third, or 251 of these 753 people, are in the present work force and over 25 years of age (3), the minimum age required to complete most professional postgraduate education. Of these 251 people, 172 are men and 79 women. Since only 6-7 per cent of all practicing physicians are women (5), we must multiply the probability of being a woman physician (.065) by the number of women (79) and add to this the probability of being a male physician (.935) multiplied by the number of men (172). This total is 166 people or the available work force from which each physician can be said to come.

To maintain the intellectual ability of the physician at the level equal to the majority (upper two-thirds) of present-day medical students, this physician must be in the upper 10 per cent of the population in general ability. Thus we find that the physician who serves a population of 753 people could in fact have been drawn from only about seventeen of these individuals.

To fill society's professional manpower needs, other professions will demand a share of these seventeen high-ability people. Societal roles which must also be filled include college president, professor and teacher, engineer, accountant, lawyer, clergyman, dentist, pharmacist, social worker, chemist, physicist, natural scientist, and social scientist. In addition, a wide variety of top-level mana-

TABLE 8  
ATTRITION BY YEAR FOR ALL MEDICAL SCHOOLS

Year	Total students originally enrolled in the four classes	Total enrolled for the given year	Attrition	Per cent Attrition
1953-54	29,487	28,227	1,260	4.3
1954-55	29,886	28,583	1,303	4.4
1955-56	30,136	28,639	1,497	5.0
1956-57	30,725	29,130	1,595	5.2
1957-58	31,306	29,473	1,833	5.9
1958-59	31,858	29,614	2,244	7.0
1959-60	32,345	30,084	2,261	7.0

gerial roles in business and industry will draw from this group. Finally, there will be a continuing and increasing demand for talent resulting from the proliferation of new roles arising out of further technological advance. Working against these demands will be the fact that, under present circumstances, not all of these seventeen people will realize their capabilities to the fullest extent possible. Some will be hampered by personality and emotional problems, and some will develop patterns of interest along other than professional lines.

Other determinants are also beyond the purview of admissions committees. Socioeconomic factors such as direct educational costs, years of preparation, and conflict with other interests such as may arise from marriage influence the decision to go to medical school.

Finally, it may be fallacious to assume that the main loss to medicine comes in the transition between college and the choice of a professional school, and therefore that the main burden for increasing the physician talent supply must lie with college counselors and new recruitment programs. Inadequate distribution of the available talent supply and imperfections in selection techniques resulting in losses through attrition may be equally or even more important. The poor student who fails has wasted another student's opportunity, and the good student who is lost because he fails to present himself to the "right school" has been wasted through poor communication. Another, well-known loss to medicine (but often a gain to the other health professions) is the student who withdraws because the curriculum at the school he has entered fails to challenge his ambitions.

Over the past 6 years there has been a two-thirds increase in the proportion of people leaving medical schools during the 4-year period. Table 8 gives these

attrition figures by year since 1953-54. Although it is true that some of these people leave to pursue graduate studies in related fields or enter more or less directly into careers in other health professions, the fact remains that each year increased proportions of students are being seated in first-year classes who will never complete their medical studies.

#### CONCLUSION

This 1959-60 applicant study notes a small decrement in the number of applicants to medical school for the third successive year. The actual size of this decrement is not particularly disturbing in view of the wide fluctuations in applicant activity over the past 13 years and in view of the continued high caliber of the accepted applicant group. When a variety of data are viewed with a little more perspective, this decrement takes on additional significance. It is becoming increasingly apparent that this trend toward fewer applicants is likely to continue and will eventually encroach upon the quality of accepted candidates. To ensure that this does not occur a number of programs have already been suggested or undertaken.

*Curriculum changes affecting admissions*—One critical factor facing students considering advanced training in a profession is the length of time necessary for preparation. There is no doubt that medicine is in the poorest competitive position in this regard. With the increase in knowledge in medical science has come the subsequent lengthening of the combined undergraduate and post-graduate courses in medical schools and hospitals. To counter these trends a number of schools have undertaken, on an experimental basis, revised curriculum plans. These plans shorten the over-all training period by combining 1 or 2 years of undergraduate liberal education with the first year or 2 of medical school. In addition, some schools are looking to

the clinical years and to the internship for ways of eliminating redundancy and conflict in these programs, thereby shortening the latter portion of the training period as well. The concomitant cut in total cost of a medical education should have a facilitative effect on applicant activity. In this 1959-60 applicant study a detailed accounting was not made of students enrolled in these programs—i.e., these students are not represented in any of the tables. In the next year or two enough data may be available to determine the effect of the programs on applicant activity in those schools and to obtain some indication of the ability level of applicants attracted to such attenuated courses of study. At the time of this report approximately 54 students were known to be pre-enrolled in the programs of three schools.<sup>1</sup>

*An applicant center as an aid to admissions.*—A second way the medical schools can meet the problem of assuring that enough qualified applicants are seated each year would be through a more effective utilization of those able students who do apply but who are unable to gain admission to a school for reasons of inequitable distribution among the schools. The establishment of procedures to facilitate the exchange of alternates among the schools could do much to ensure the maximum utilization of available talent.

*Recruitment activities.*—The effectiveness of recruitment programs now in progress will be extremely difficult to evaluate. These programs range from the isolated publication of brochures to clubs sponsored by local medical societies to the integrated program complete with a recruitment movie sponsored by

the American Medical Association in conjunction with the Association of American Medical Colleges. Although these approaches may stimulate interest in the field and serve an educative function, major changes in attitude toward career choice will probably continue to be dependent on individual counseling and assistance. In the last analysis career attitudes will continue to be severely affected by financial factors, length of schooling, and the availability of equally desirable alternatives.

#### APPENDIX

Tables A-1, A-2, A-3, and A-4 are traditional applicant study tables, reproduced here to round out the picture presented in preceding studies. There are no noteworthy deviations from previous data, but readers concerned with school-by-school breakdowns of applicant behavior and with regional differences will find the tables of particular interest. Specifically, it should be noted that the 1959-60 applicant study data served as the basis for inception of a new regular report to medical schools from the Division of Basic Research. This report lists for each school the distribution of MCAT part scores received by all students applying to that school, with an additional separate distribution for the scores of students actually enrolled by the school. Acknowledgment of the utility of this report by the schools has been encouraged. To further enhance the use of these individual school reports, normative data are presented in Tables A-5a to A-5f. These per cent distributions offer comparative norms on a regional as well as national basis.

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<sup>1</sup> Of interest here is a recent issue of *The Newsletter* of the Inter-University Committee on the Superior Student (Vol. 3, No. 7, Boulder, Colorado, November, 1960) containing articles describing these and other programs concerned with integrating the liberal and medical education curricula.

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TABLE A-1

## NEW FIRST-YEAR ENTRANTS AND APPLICATION ACTIVITY OF APPLICANTS TO EACH SCHOOL

School	Entrants to first-year class	No. applicants to each school			Total applications by each school's applicants	Av. no. applications made by each school's applicants
		Men	Women	Total		
Alabama	80	358	28	386	2,205	5.7
Albany	60	1,025	49	1,074	10,764	10.0
Arkansas	87	157	10	167	253	1.5
Baylor	83	815	40	855	6,408	7.5
Boston	72	1,054	86	1,140	11,046	9.7
Bowman Gray	55	463	17	480	3,628	7.6
Buffalo	81	519	28	547	5,392	9.8
California, L. A.	57	469	54	523	4,014	7.7
California, S. F.	101	591	51	642	4,343	6.8
Chicago Medical	72	1,031	26	1,057	10,416	9.9
Chicago, Univ. of	73	899	59	958	7,857	8.2
Cincinnati	92	967	29	996	8,202	8.2
Colorado	85	234	9	243	968	4.0
Columbia P. & S.	118	1,130	119	1,249	9,930	8.0
Cornell	83	1,088	110	1,198	9,904	8.3
Creighton	77	963	32	995	8,154	8.2
Dartmouth	24	273	6	279	2,567	9.2
Duke	76	937	42	979	7,956	8.1
Einstein (Yeshiva)	94	996	76	1,072	10,927	10.2
Emory	72	591	21	612	3,919	6.4
Florida	48	383	19	402	2,692	6.7
Georgetown	110	1,011	47	1,058	9,542	9.0
George Washington	101	1,248	67	1,315	11,931	9.1
Georgia	98	279	13	292	643	2.2
Hahnemann	110	997	42	1,039	8,394	8.1
Harvard	114	1,021	98	1,119	7,453	6.7
Howard	100	554	55	609	3,232	5.3
Illinois	197	629	36	665	2,828	4.3
Indiana	177	494	29	523	2,785	5.3
Iowa	117	161	9	170	437	2.6
Jefferson	172	1,475	1	1,476	10,962	7.4
Johns Hopkins	76	762	61	823	6,514	7.9

TABLE A-1 (Continued)  
NEW FIRST-YEAR ENTRANTS AND APPLICATION ACTIVITY OF APPLICANTS TO EACH SCHOOL

School	Entrants to first-year class	No. applicants to each school			Total applications by each school's applicants	Av. no. applications made by each school's applicants
		Men	Women	Total		
Kansas	100	268	16	284	1,489	5.2
Louisiana	124	254	14	268	724	2.7
Louisville	95	291	12	303	1,576	5.2
Loyola (Stritch)	88	662	33	695	4,823	6.9
Marquette	103	781	40	821	5,837	7.1
Maryland	99	279	20	299	2,606	8.7
Medical Evangelists	95	218	17	235	1,008	4.3
Meharry	65	317	38	355	1,094	3.1
Miami	80	213	7	220	1,195	5.4
Michigan	194	738	60	798	3,923	4.9
Minnesota	141	294	26	320	1,200	3.8
Mississippi	77	209	11	220	943	4.3
Missouri	74	160	14	174	516	3.0
Nebraska	85	199	9	208	639	3.1
New York Medical	127	1,613	115	1,728	15,934	9.2
New York University	130	1,234	115	1,349	12,865	9.5
North Carolina	68	231	8	239	1,206	5.0
North Dakota	44	86	3	89	254	2.9
Northwestern	129	1,254	60	1,314	9,545	7.3
Ohio State	149	483	23	506	2,258	4.5
Oklahoma	96	192	12	204	940	4.6
Oregon	76	370	17	387	2,450	6.3
Pennsylvania	126	1,404	84	1,488	11,858	8.0
Pittsburgh	98	559	41	600	4,928	8.2
Puerto Rico	50	101	17	118	433	3.7
Rochester	71	971	62	1,033	9,797	9.5
St. Louis	106	1,070	31	1,101	8,900	8.1
Seton Hall	81	1,087	69	1,156	10,730	9.3
South Carolina	80	176	6	182	409	2.2
South Dakota	39	298	11	309	2,307	7.5
Southern California	68	602	41	643	5,179	8.1
Southwestern	100	454	31	485	1,593	3.3
Stanford	70	664	44	708	6,001	8.5
State U.N.Y., N.Y.C.	152	1,150	106	1,256	11,833	9.4
State U.N.Y., Syracuse	81	829	65	894	8,509	9.5
Temple	135	1,316	82	1,398	10,943	7.8
Tennessee	200	733	36	769	2,033	2.6
Texas	137	470	32	502	1,613	3.2
Tufts	114	989	77	1,066	10,263	9.6
Tulane	130	1,101	48	1,149	7,988	7.0
Utah	55	304	9	313	1,976	6.3
Vanderbilt	52	616	25	641	5,516	8.6
Vermont	51	348	27	375	3,152	8.4
Virginia, Med. Col.	84	378	21	399	2,424	6.1
Virginia, Univ. of	76	506	32	538	4,268	7.9
Washington, St. Louis	85	1,250	53	1,303	10,287	7.9
Washington, Univ of	75	375	40	415	2,513	6.1
Wayne	126	335	29	364	1,166	3.2
Western Reserve	83	1,137	86	1,223	7,987	6.5
West Virginia	45	101	8	109	313	2.9
Wisconsin	82	250	18	268	1,406	5.2
Woman's Medical	51	220	220	220	1,258	5.7
Yale	79	836	68	904	7,240	8.0
Total	7,983	54,330	3,558	57,888*		3.9

\* Note that this figure is the total number of applications made by 14,952 individuals.

TABLE A-2  
ACCEPTANCE DATA ON APPLICANTS BY STATE

State	Applicants receiving one or more acceptances			Per cent	Applicants not accepted			Total no. applicants	Total no. applications
	Men	Women	Total		Men	Women	Total		
Alabama	115	8	123	47	126	11	137	260	608
Alaska	5	5	100					5	31
Arizona	40	5	45	64	23	2	25	70	321
Arkansas	109	7	116	63	65	4	69	185	288
California	397	34	431	44	499	41	540	971	5,220
Colorado	88	3	91	61	55	3	58	149	345
Connecticut	91	8	99	49	95	10	105	204	1,230
Delaware	17	1	18	64	10		10	28	134
District of Columbia	62	2	64	46	66	9	75	139	458
Florida	199	11	210	62	126	3	129	339	1,151
Georgia	169	8	177	48	179	10	189	366	806
Hawaii	19	2	21	100				21	109
Idaho	27	1	28	52	26		26	54	223
Illinois	464	12	476	59	301	29	330	806	2,768
Indiana	197	9	206	60	128	9	137	343	829
Iowa	149	11	160	78	42	2	44	204	466
Kansas	104	4	108	67	48	5	53	161	391
Kentucky	140	5	145	61	81	11	92	237	624
Louisiana	154	13	167	63	94	3	97	264	476
Maine	17	2	19	54	11	5	16	35	139
Maryland	118	13	131	62	72	10	82	213	783
Massachusetts	207	18	225	53	179	17	196	421	2,433
Michigan	336	18	354	58	233	28	261	615	1,589
Minnesota	171	12	183	72	63	8	71	254	559
Mississippi	101	9	110	61	68	3	71	181	297
Missouri	137	10	147	61	89	4	93	240	614
Montana	29	2	31	55	21	4	25	56	231
Nebraska	103	6	109	64	59	2	61	170	355
Nevada	6		6	50	6		6	12	64
New Hampshire	16	3	19	66	8	2	10	29	150
New Jersey	297	15	312	52	273	18	291	603	3,749
New Mexico	22		22	65	10	2	12	34	147
New York	1,014	103	1,117	55	820	81	901	2,018	13,978
North Carolina	155	8	163	59	107	4	111	274	735
North Dakota	48	1	49	77	15		15	64	97
Ohio	431	22	453	58	313	15	328	781	3,049
Oklahoma	126	7	133	80	31	3	34	167	304
Oregon	73	5	78	60	48	4	52	130	374
Pennsylvania	565	52	617	57	430	28	458	1,075	4,176
Rhode Island	28	2	30	54	24	2	26	56	315
South Carolina	112	9	121	57	92		92	213	471
South Dakota	35	3	38	76	12		12	50	87
Tennessee	213	14	227	68	99	6	105	332	573
Texas	329	21	350	54	273	23	296	646	1,886
Utah	59		59	52	55		55	114	333
Vermont	18	1	19	70	8		8	27	50
Virginia	140	6	146	57	98	11	109	255	691
Washington	91	8	99	55	74	7	81	180	581
West Virginia	82	5	87	61	54	2	56	143	407
Wisconsin	158	10	168	66	83	4	87	255	633
Wyoming	16		16	55	13		13	29	126
Puerto Rico	47	6	53	50	45	9	54	107	224
U.S. Possessions	5		5	12	33	2	35	40	171
Canada	16	1	17	29	36	5	41	58	161
Foreign	97	8	105	43	120	17	137	242	849
Not stated	4		4		18	5	23	27	29
Total	7,968	544	8,512		5,958	482	6,440	14,952	57,888

TABLE A-3  
MEDICAL SCHOOL APPLICANTS AND ACCEPTANCES PER STATE POPULATION, 1959-60

State	Popu- lation ( $\times 1,000$ )	No. appli- cants	Appli- cants per 100,000 popu- lation	Per cent of total appli- cants	No. accept- ances	Accept- ances per 100,000 popu- lation	Per cent of total accept- ances
Alabama	3,136	260	8.29	1.7	123	3.92	1.4
Alaska	164	5	3.05	.0*	5	3.05	.1
Arizona	1,053	70	6.65	.5	45	4.27	.5
Arkansas	1,757	185	10.53	1.2	116	6.60	1.4
California	13,551	971	7.17	6.5	431	3.18	5.1
Colorado	1,624	149	9.17	1.0	91	5.60	1.1
Connecticut	2,257	204	9.04	1.4	99	4.39	1.2
Delaware	426	28	6.57	.2	18	4.23	.2
District of Columbia	798	139	17.42	.9	64	8.02	.7
Florida	4,111	339	8.25	2.3	210	5.11	2.5
Georgia	3,691	366	9.92	2.5	177	4.80	2.1
Hawaii	554	21	3.79	.1	21	3.79	.2
Idaho	640	54	8.44	.4	28	4.38	.3
Illinois	9,647	806	8.35	5.4	476	4.93	5.6
Indiana	4,499	343	7.62	2.3	206	4.58	2.4
Iowa	2,781	204	7.34	1.4	160	5.75	1.9
Kansas	2,058	161	7.82	1.1	108	5.25	1.3
Kentucky	3,003	237	7.89	1.6	145	4.83	1.7
Louisiana	3,022	264	8.74	1.8	167	5.53	2.0
Maine	923	35	3.79	.2	19	2.06	.2
Maryland	2,830	213	7.53	1.4	131	4.63	1.5
Massachusetts	4,775	421	8.82	2.8	225	4.71	2.6
Michigan	7,691	615	8.00	4.1	354	4.60	4.2
Minnesota	3,312	254	7.67	1.7	183	5.53	2.1
Mississippi	2,150	181	8.42	1.2	110	5.12	1.3
Missouri	4,210	240	5.70	1.6	147	3.49	1.7
Montana	666	56	8.41	.4	31	4.65	.4
Nebraska	1,424	170	11.94	1.1	109	7.65	1.3
Nevada	253	12	4.74	.1	6	2.37	.1
New Hampshire	566	29	5.12	.2	19	3.36	.2
New Jersey	5,572	603	10.82	4.0	312	5.60	3.7
New Mexico	789	34	4.31	.2	22	2.79	.3
New York	16,098	2,018	12.54	13.5	1,117	6.94	13.1
North Carolina	4,388	274	6.24	1.8	163	3.71	1.9
North Dakota	644	64	9.94	.4	49	7.61	.6
Ohio	9,186	781	8.50	5.2	453	4.93	5.3
Oklahoma	2,221	167	7.52	1.1	133	5.99	1.6
Oregon	1,739	130	7.48	.9	78	4.49	.9
Pennsylvania	10,990	1,075	9.78	7.2	617	5.61	7.2
Rhode Island	828	56	6.76	.4	30	3.62	.4
South Carolina	2,311	213	9.22	1.4	121	5.24	1.4
South Dakota	687	50	7.28	.3	38	5.53	.4
Tennessee	3,423	332	9.70	2.2	227	6.63	2.7
Texas	8,989	646	7.19	4.3	350	3.89	4.1
Utah	836	114	13.64	.8	59	7.06	.7
Vermont	368	27	7.34	.2	19	5.16	.2
Virginia	3,664	255	6.96	1.7	146	3.98	1.7
Washington	2,653	180	6.78	1.2	99	3.73	1.2
West Virginia	1,962	143	7.29	1.0	87	4.43	1.0
Wisconsin	3,855	255	6.61	1.7	168	4.36	2.0
Wyoming	310	29	9.35	.2	16	5.16	.2
U. S. Possessions		40		.3	5	25.00	.1
Puerto Rico	2,272	107	4.71	.7	53	2.33	.6
Canada		58		.4	17		.2
Foreign		242		1.6	105		1.2
Not stated		27		.2	4		.0*
Total		14,952		100.0	8,512		100.0

\* Indicates less than .1

TABLE A-4

No. applications filed	Verbal	Quantitative	Modern Society	Science	No. individuals
1	489	490	493	479	4,447
2	494	490	495	487	2,177
3	503	500	503	493	1,919
4	512	504	512	509	1,474
5	516	507	511	507	1,119
6	518	504	515	508	834
7	528	514	523	517	589
8	521	506	518	511	469
9	531	508	530	513	299
10-14	529	504	523	511	808
15-19	523	485	529	496	231
20-24	513	488	514	488	59
25-29	502	467	484	476	21
30-34	514	496	528	511	15
35-39	471	423	527	461	5
40 or more	565	415	515	525	2
Average for all applicants	504	497	505	494	14,468

**TABLE A-5a**  
**PER CENT DISTRIBUTION OF MCAT SCORES FOR APPLICANTS  
 ENROLLED OR APPLYING TO SCHOOLS IN THE NORTHEAST REGION**

TABLE A-5b  
PER CENT DISTRIBUTION OF MCAT SCORES FOR APPLICANTS  
ENROLLED OR APPLYING TO SCHOOLS IN THE NORTH CENTRAL REGION

TABLE A-5c  
PER CENT DISTRIBUTION OF MCAT SCORES FOR APPLICANTS  
ENROLLED OR APPLYING TO SCHOOLS IN THE SOUTHEAST REGION

TABLE A-5d  
PER CENT DISTRIBUTION OF MCAT SCORES FOR APPLICANTS  
ENROLLED OR APPLYING TO SCHOOLS IN THE SOUTH CENTRAL REGION



# The Growth of Medical Education in East Africa\*

ALEXANDER GALLOWAY†

Makerere College, Medical School, The University College of East Africa, Kampala,  
Uganda, East Africa

The written history of East Africa is very recent. After the late 19th-century scramble for East Africa there was only a short period for consolidation before the first world war. The settlers were trying to find their feet, administrators were trying hard to administrate, but on the whole their efforts were made futile because of the lack of previous colonial experience. However, the beginnings of the social services were laid down and, amongst them, medicine.

Up to this period, however, the missionary had been carrying on his unobtrusive work. It is unfortunate that by so many people the missions are known only for their evangelic proselytizing zeal; but it was they who laid down the foundations in East Africa of social services such as education and medicine, and it was they who first started medical and nursing training. On the whole the colonial administrator was only too happy to learn from the missionary.

After 1919 a new concept in colonial development and colonial rule came in—the concept of trusteeship and indirect rule. Greater emphasis was now placed on training the African in general, and in academic education in particular.

Doctors and Nursing Sisters were fairly easy to recruit up to the limits of money available, but there was a great lack of junior ancillary staff. To overcome this lack the Colonial medical services entered the field of medical training

in the East African territories, with the training of hospital orderlies, hospital assistants, disease spotters, health assistants, and so on. The training of African women as nurses came much later—another expression of the lack of elementary education for girls, due more to tribal customs and tribal concepts of the place of women than to anything else.

The idea that the African could be trained as a doctor had not entered the minds of the Administration between the two wars. If it did, it did so sporadically, and was dismissed. Even as late as 1947 it was still being debated whether medical education should be given to the many at a low level or to the few at university level. The concept of medical education for the many at a low level was consciously based on the obvious need for a large body of people with a basic training to cope with the more obvious manifestations of African disease, and to institute and preach the basic tenets of health. It was based, subconsciously, however, on the belief that no African was capable of absorbing medical education at the university level.

However, in Uganda, there was one, Dr. Owen, who felt differently, and who, by his insistence, found himself in 1923 appointed the first tutor in medicine in a medical school run under the auspices of the Uganda Medical Department at Mulago Hospital in conjunction with Makerere College.

Makerere College started as a technical school in 1821, but soon the scope of the school was enlarged by the addition of a

\* The University of Cape Town, M. R. Drennan lecture, delivered on Friday, November 18, 1960.

†Dean, Faculty of Medicine.

class for medical assistants. Even as early as 1925 plans were being made for Makerere College to become a University College. As a beginning to the fulfilment of this aim it was already a center for higher vocational training, with courses in teaching, mechanics, survey, agriculture, and medicine.

The numbers available for training were small, usually three to four in each year. The people were not there to train. The handful of successful secondary school pupils were eagerly competed for by all Government departments—for school teachers, veterinary and agricultural assistants, clerks, as well as for doctors.

The medical course was a 4-year one. One year premedical science, 1 year pre-clinical studies, and 2 years clinical studies. After qualifying and receiving the Certificate of Medicine, Makerere College (and the first group qualified in 1927), the young man received the designation of A.M.O., Assistant Medical Officer. Soon, however, in his pride of achievement, he called himself African Medical Officer, in spite of the continued official departmental designation of Assistant Medical Officer.

The medical course given was an abbreviated university one—essentially practical, with a minimum of academic theory. Emergency operative surgery, for instance, was emphasized, and the average A.M.O. had great expertness in dealing with a strangulated hernia or a stab wound. During the last war many a young South African medical officer seconded to the East African Medical Corps and posted as Medical Officer to a lonely station, say on the Juba/Soroti sector, was surprised to find this local African doctor with a surgical skill far exceeding his own, even if it was accompanied by great lacunae of knowledge of the classifications of renal diseases or of the anemias.

Of course at times things went wrong, and gross mistakes were made. There were frequent lapses in medical ethics, which became the main topic of criticism of the A.M.O. rather than his achievements. We are apt to misguide ourselves that our concept of medical ethics is a strange mystique, given to Western civilization through some divine implantation. We forget that medical ethics, as we know them today, is not a code of behavior created by the medical profession but one forced upon it by enlightened public opinion. There is, as yet, no such enlightened African opinion in East Africa, although it is growing. Excluding the urban areas, there is in East Africa one doctor for about every 30,000 people. Until the black market in medical practice is destroyed by greatly increasing the number of doctors, and until there is a widespread enlightened African public opinion, these lapses in medical ethics will continue. However, when observing these lapses, let us keep a critical watch on our own system, and not fall into the mote and beam fallacy.

All the teaching in this Uganda Medical Department Medical School was done by the Mulago Hospital expatriate medical officer, and as the years go by his great contribution to medical education is being lost sight of—for, without him and the foundations he laid down, medical education in East Africa would not be as advanced as it is today. The Colonial Medical Service has been well served by its medical officers, usually men of good average ability, some scientific, some socialite, hermit, eccentric, normal, abnormal, but all imbued with a sense of social service, although they would be the first to deny this imputation. The teacher of anatomy, for instance, would have his general wards in the hospital, he would be in charge of a specialty, he had to visit his dis-

pensaries, he was a medical officer for health, yet he found time to teach the anatomy of the human body in one year up to a very adequate standard.

The success of this new medical school became known in the other territories of East Africa, which asked permission to send selected students to the school. In 1935 the inter-territorial nature of the school was officially recognized, and a Joint Board of Examiners in Medicine was set up, whose main functions were to act as a Board of Examiners, scrutinize the curricula, and lay down minimal standards. The clinical course was lengthened to three years, and the Certificate in Medicine (Makerere College) changed to a Diploma in Medicine (East Africa).

The occasional young doctor showed greater capabilities than his fellows, and by the end of the war, from a combination of shortage of staff and competence, some were acting as assistant physicians, surgeons, and medical officers of health.

During the darkest days of 1940 a great act of faith took place. The Parliament in Westminster passed its first Colonial Development and Welfare Act, and detailed plans for Colonial advance-

ment were made. Later the Asquith Commission recommended the setting up of colonial universities, and immediately after the war these were implemented. Makerere Hill, in Kampala, was chosen as the site of the new East African University, starting as a University College under the wing of the University of London, and the existing school buildings became the center of the campus.

By this time Makerere College had widened its scope. It now offered Arts and Science to "Junior College" level. The science standard roughly equated with first M.B. requirements. A Teacher Training College with its demonstration school was in existence, and agriculture and veterinary science were taught, although, like medicine, at sub-university standards.

In 1947 the medical school became a faculty of the new University College and lost its formal close connection with the Uganda Medical Department, but retained its intricately knit symbiosis with Mulago Hospital.

This new university venture got off to a shaky start, mainly due to staffing difficulties and the poor quality of students. The war years had seen the grad-



FIG. 1.—The Medical School, 1939.

ual draining away from the East African schools of the European teacher to the armed forces, and school education as a result, in the last 2 years of the war, reached a very low standard. For instance, the intake to the medical school in 1948 was such that only one of that group finished the course. By this time, however, the schools were better staffed, and the college intake increased in numbers and quality. The college staff was gradually strengthened, and year by year the medical school entry rose from under ten a year to 30. From lack of money the entry has been fixed at 30 for the past 3 years, although this year some 50 had more than reached the minimal educational entry standards. This financial bottleneck is in the process of being eased, and the intake will be 50 in 3 years' time without reduction in educational standards.

At present the entrance requirements for the medical school are to have passed the University of London Preliminary Examination in Chemistry, Physics, and Biology—that is, with three C's. Such is the competition that this year only those with a B and two C's were accepted, and the B was either in Chemistry or Physics. When the system changes and direct entry from schools is instituted, the minimal requirements will be passes in Physics, Chemistry, and either Biology or Zoology in the examinations for the General Certificate of Education. Of these three passes at least two must be at "Advanced Level," and the third at "Ordinary Level."

Several senior secondary schools throughout East Africa have been selected for sixth form work, to train candidates for the General Certificate of Education, and 1962 will see the first direct entry into the medical school. It is uncertain whether this direct entry will be of the same standard that has obtained previously, but there is much

pessimism. This could mean that even with an intake raising from 30 to 50 in the next 5 years that the output will remain the same or even drop. In 1955 a report was published on "Medical and Health Services in Uganda." This report seemed to complain that the preclinical 10 per cent wastage found in British medical schools did not apply at Makerere. It is thought that such a complaint will not be justifiable in 1965.

The Science faculty has served the Medical School well. Such is the high standard of training given in the pre-medical sciences that the incipient medical student is a knowledgeable, educated young man. It is most unusual for a medical student not to finish the course once he has entered his first preclinical year. If a student falls out it is from health or family reasons. It is this rigorous selection associated with teaching in small groups which makes output equate with intake, and nothing magical either in staff or student.

In 1946 the first two full-time teachers in the medical school in physiology and anatomy were appointed. In 1947 the preclinical course was lengthened to 2 years, and the planning and building of new laboratories were commenced. The Asquith Commission was convinced that any new Colonial University College would be unable to stand on its own feet at the outset, its standards would appear low, and, therefore, be unacceptable, so the recommendation that the college should, for an initial period, enter into special relations with a British university was accepted, and the University of London undertook this task. The faculties of Arts and Science accepted the scheme of special relations, but the medical school decided against it. Instead it made its aim to raise its standards to a degree acceptable to the General Medical Council. This enabled the school to devise its own detailed curricula more in

terms of medicine in the tropics and less in terms of medicine of north of Cancer. It was hoped that this aim would be achieved at the same time as the College received full university status; in fact, recognition by the General Medical Council was obtained in 1957, while the college is still a University College.

Apart from teaching and administering their departments, the new heads of the preclinical departments had the job of planning the first stages of development of the new medical school. These preclinical departments occupied single-storied, corrugated iron-roofed buildings. It was necessary to get new preclinical buildings built so that the old buildings could accommodate the full-time clinical staff which was urgently required, and this pattern still obtains. No new department is ever housed in a new building; they all take a turn of an old building. This is not the result of any hard and fast rule—it just happened. The preclinical people knew what buildings they wanted but were not pre-

pared to plan clinical buildings. That was better done by the clinicians themselves, and so grew up the system of the newcomer pioneering in the original buildings while he planned the building he himself required.

The process of curriculum-building was limited by the fact that there was already a curriculum in existence which had proved successful and was obviously being jealously guarded from any new broom.

Because of its history, therefore, the pattern of education in the medical school is "adapted traditional." In the early days the only type of medical education the colonial medical officer knew was that of his own medical school, and since it seems that most medical officers came either from the Scottish Universities or the London Teaching Hospitals, the basic pattern of instruction became a strange blend of both systems, further blended with what is known to be expected of the student when he qualifies.

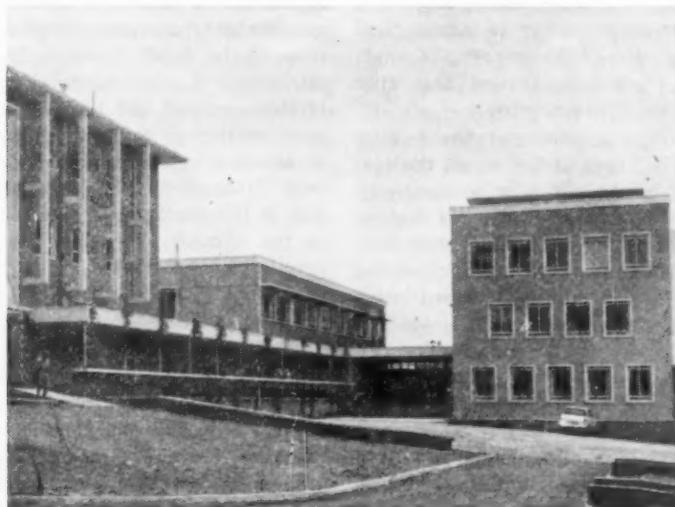


FIG. 2.—A part of the Medical School, 1959. On the left is a portion of the Anatomy Building; in the center, the Library; on the right, part of Pathology and Microbacteriology.

The two preclinical years at Makerere are devoted to anatomy and physiology, and toward the end of the second year a short course on the principles of pathology is given, whereas at the beginning of the preclinical course organic chemistry is taught. Biochemistry is still regarded as a branch of physiology and will remain so until physiology can be offered as a science discipline. As long as the teaching in the Department of Physiology is limited to medical students biochemistry should be taught as an integral part of physiology.

There are the usual mutterings at the length of time devoted to anatomy and physiology, and envious eyes are cast on what seems spare periods in the pre-clinical time tables. Attempts have been made to fill these up with pharmacology and the innumerable little things the clinical traditionalist cannot fit into his concept of a clinical time-table.

It is possible that there is a rate of absorption of knowledge for each ethnic group dependent on its state of advancement. It is this rate of absorption which is the important factor to assess, and any acceleration of the teaching of anatomy and physiology beyond this rate would not be advantageous.

If the synoptic lecture system is ever to be replaced then at the outset the student must be taught how to use a library intelligently, and how to feel at home in it. It is necessary, therefore, that the librarian introduce him at the beginning of his studies to the library and explains how it works. The student must then have time to put into practice what he has been taught. The majority of students come from homes where the use of books is unknown. Books to many of them are tools of learning and have no part to play in the intelligent use of leisure. The use of books is as an important a part of their training as an educated citizen as their specialized med-

ical training is. The doctor, as much as any other educated man, has his part to play in the spread of books throughout an emergent country.

It is estimated that on the average in medical schools in the United Kingdom the proportion of time allotted to pre-clinical studies by staff and students combined is: anatomy, 7; physiology, 2; biochemistry, 1, despite the fact that the greater part of that aspect of human biology known as medicine depends on biochemistry and now even the surgeon is seeking its aid. There is a general lack of interest in biochemistry on the part of the student, and this is frequently blamed on anatomy. Anatomy is an easy factual subject, and because of this a student spends most of his time on it. The anatomy teacher is more often medically qualified than is the biochemist, and so gives the appearance that anatomy is nearer to the core of an understanding of medicine than any of the other pre-clinical disciplines, and so on.

The biochemical knowledge of the British clinician is usually dated to the era in which he gets his membership, and this filters down through the clinical student to his preclinical brother, and is the cause of the lack of interest in biochemistry on the part of the student. It appears to the clinical student that very little of the biochemistry offered him in the preclinical years is ever used in the clinical years, and he tells the preclinical student this. Until the appreciation of the clinician of the value of biochemistry is made clear to the undergraduate, then this lowly place of biochemistry will be maintained in the curriculum.

This is not so in American medical schools, where the clinician demands greater and greater emphasis on the physiological sciences in both the pre-clinical and clinical years of instruction.

At Makerere a happier distribution of

preclinical time has been arrived at. The proportion works out at: anatomy, 3; physiology, 2; biochemistry, 1. There are those who think that too much time is spent on anatomy, but then there are those who still think of anatomy as a dissecting room exercise and forget that anatomy embraces histology, which embraces histochemistry and odd bits the electron microscope has recorded, as well as embryology, neuroanatomy and the study of man. By placing the emphasis on biochemistry in the second preclinical year after the student has received the ground work of the other preclinical disciplines happy results are achieved.

The time tables in the clinical years are difficult. The clinical teacher is adept at adding to the scope of his subject but can never prune. This is a world-wide criticism, and Makerere is well in step here. Fifteen years ago the 3 clinical years were devoted to surgery, medicine, obstetrics, and pathology, including bacteriology. Short courses in preventive medicine, ophthalmology, and venereal diseases were given. The senior clinical disciplines have been loath to give up their original proportions of time, so that there is difficulty in fitting in the demands for time for more specialities in medicine and surgery as well as coping with the growing demands of preventive medicine, pediatrics, and so on.

The result is that the clinical student is working or being talked at all day long and has no time for himself. It would be well if the Goodenough Report were re-studied, if only to revive the concept implicit in the findings of that report that the clinical disciplines in their scientific aspects consist of applied physiology, applied pathology, and applied anatomy. Such a re-examination might result in more time being made available to the clinical student for his own use, time in which he could continue the reading habits which were incul-

cated into him during his preclinical years, and perhaps time to do that small piece of investigation which so many students would like to tackle. These criticisms of the clinical course are not specific but general.

Whereas most attention is paid to the teaching of the more placid aspects of medicine, there is still strong emphasis placed on acute conditions. This is most necessary.

From the moment a young doctor has finished his house appointments and is sent to an up-country station, he is his own emergency specialist. Unlike the general practitioner of the Western world who has every specialist almost at his elbow, the African doctor is usually stationed far away from the specialist centers and "has to do it himself." This great difference is well illustrated in Sir Dougal Baird's recent article in the *Lancet*. He wrote that "only a proportion of doctors should practice obstetrics, and only those who have had post-graduate experience should do operative obstetrics. We should, therefore, concentrate on giving students a broad view of the problems of human reproduction and spend less time on the management of abnormalities in labour."<sup>1</sup> Such a statement, very wise for the mature society for which it was written, illustrates the great difference in the approach to medical education in the United Kingdom and in a new country. If the management of abnormalities in labor were given such a low place in the teaching program at Makerere, all that would be achieved would be a heightening of an already high maternal mortality.

The term tropical medicine is becoming more and more disliked, since it in no way reflects the nature of medicine practiced in the tropics. "Tropical medicine" is that body of information contained in the 1,000 odd pages of Manson Bahr's text book, of which only about 100 apply

to East Africa, and these 100 pages represent a very small percentage indeed of medical practice in the tropics. The proper term is "Medicine in the Tropics," the great part of which is concerned with the special tropical manifestations of temperate zone diseases, and this is the major part of clinical teaching.

The proper teaching of these diseases, with their local facies and their temperate zone appearance, gives the student something of that background required for graduate studies overseas by foreign students. Such a background is essential, and the idea is implicit in Weir's *Review of Obstacles to Medical Education at the International Level*.

At this point it is necessary to state that the Makerere College Medical School is not one of those schools to which Weir is referring. In his article he points out that the first, and perhaps most foremost, problem of foreign medical education is the problem of limitation of admissions to medical schools, and the general lack of selective procedure for admissions. This, he says, does not apply to such countries as the United Kingdom, Sweden and Norway, or to one or two countries outside Europe. East Africa is definitely one of these one or two countries. It is necessary to say this, since Weir with his high authority and wide experience could be read as though East Africa were not. At Makerere College Medical School there is strict selection for entry. There are no impossible staff/student ratios. Teaching is carried out more by practical work in the laboratory than by synoptic lecturing. The teachers do not give up most of their time to private practice. The students' clerkships are real ones, and in the clinical years systematic teaching takes a poor second place to real practical clinical experience gained in the wards. As a result, when the student qualifies, he is as able to benefit from

higher studies as is any young doctor in Europe or America.

Once the full-time clinical teachers in surgery, medicine, and obstetrics had their departments organized it became apparent that if the Makerere College Medical Diploma was to be recognized by the General Medical Council several departments and sub-departments would have to be strengthened. Specialities such as Anesthetics, Ear, Nose, and Throat, etc., were built up by the hospital over the years, and only recently the general surgeon has been relieved of the remainder of the ancillaries by the hospital's appointing a chest surgeon and the college an orthopedic one.

It had always been realized that pediatrics and child health did not have a proper place either in the curative programme of the hospital or in the curriculum of the medical school, owing to the lack of money for staff. In the '40s Dr. Trowell took on the load of organizing a pediatrics curative and teaching unit, in addition to his many other duties as senior medical specialist. Fortunately in the early '50s, the Great Ormond Street Hospital for Sick Children became aware of the difficulties at Mulago which were complementary to their own difficulties of finding the necessary experience for some of their potential future senior pediatricians in the field of pediatrics in the tropics. A joint project was entered into in 1954 by Great Ormond Street, the Uganda Government and Makerere College, which places in Mulago Hospital a Senior Pediatrics Registrar and two Pediatric Nursing Sisters. This scheme immediately improved curative and teaching standards. The next step forward was when UNICEF made it financially possible in 1958 for Makerere College to create a chair in social pediatrics. Now pediatrics, both from the curative aspect and from the social medicine aspect, has its

full place in the hospital and in the Medical School.

A proper attitude to preventive medicine was difficult to obtain in the early days. Modern concepts, some verging on the philosophic, did not seem to have a place in the heart of Africa, where the very elements of hygiene were still being drilled into the minds of the local population. It was frequently said that social medicine was the next stage after the stage of sanitation, which was already closing in Europe, but social medicine had no place in Africa where the era of sanitation was just beginning. This was another example of the fallacy that there is a fixed pattern for social evolution—the European one; and that Africa must go through all the stages of social evolution, step by step, as Europe did. This is not necessary. Africa need not experiment, as Europe did, but can achieve this social evolution by geometric progression as it were, where Europe did it by an arithmetic one. It is fundamentally a matter of potential, and there is great potential in the African.

In the matter of preventive medicine it is a case of the two necessities—hygiene on the one hand and social medicine on the other, being taught together. One is not exclusive of the other, and that is what is happening. More than 90 per cent of East Africa's population is rural, so rural health has to be stressed. With this in view the college has built a Health Center near Kampala, in a completely rural environment, and here the basic concept of social medicine, the individual and his environment, is given.

New concepts in mental health and psychiatry in the main have been accepted in principle, but have not been put into practice because of existing buildings and the usual limitations in finance. At present the old 600-bed mental hospital is in the process of being replaced by a new one. The existing

custodial hospital is built on the old principle that the mentally sick should be hidden away and not allowed to be an offense to the public. This is really what is meant by "custodial." Modern treatment is made very difficult in such an environment.

Equipment is always more easily replaced than buildings, and many clinical departments working in dingy and inconvenient surroundings are, nevertheless, able to offer their patients the latest forms of treatment. To the mental hospital, on the other hand, outdated and ugly buildings are a much heavier handicap because the patients' surroundings are so much more important. The new hospital of 800 beds is being built some miles away, but unfortunately it does not measure up to modern design or modern requirements.

It will continue to be as understaffed as the old one. For instance, there is, for 600 patients, a Consultant Psychiatrist who is also Medical Superintendent to the hospital, a part-time medical school lecturer in mental diseases is inundated with Court work, and in his odd spare moment is interested in investigating mental ill health in the African. He may have an assistant consultant if the young man is successful in gaining his higher qualification in psychological medicine.

There can be no real instruction given in such an environment where it has to be assumed that normal human behavior in Uganda has the same pattern as that of the Asian or the Caucasian, because no one has proved it to be otherwise, and where treatment is carried out under unsatisfactory conditions.

This concept of the comparative pattern of normal human behavior is vital for proper treatment, since there is no proof for assuming that the pattern of normal human behavior of the African in South Africa is the same as that of

the African in East or West Africa; or, narrowing it down, that the Acholi of Uganda and the Kikuyu of Kenya share the same pattern. This hypothesis must be proved or disproved before rational psychiatric treatment can be given or real instruction attempted.

At the same time some concern has been felt by the College Health Service about the incidence of minor mental breakdowns, with one or two major ones. The Nuffield Foundation made it possible for Dr. D. L. Davies, Dean of the Institute of Psychiatry of the University of London, to visit East Africa and examine this mental health problem and advise on mechanisms of teaching and research. As a result of this a 10-year project is envisaged, but it may have the same fate as so many other vital projects—death from financial inanition. This project makes provision for a professorial psychiatric unit with complementary ancillary staff, a clinical psychiatric unit with an out-patient department, and an early treatment center in immediate contact with the teaching hospital, so that psychiatry will no longer appear as an alien discipline but one of equal status with the other major clinical disciplines. If such a project is accepted and can be financed, then mental health from the curative, teaching, and research angles will achieve its proper level.

The first Medical Library in Uganda was the personal property of Sir Albert Cook, the founder of European medicine in Uganda. In his mission hospital on Namirembe hill near Kampala he created a great center of healing. There was no time for investigation or research in his 48-hour day, but he realized that every clinical observation that he made had a potential future value. His case notes, accurate and detailed, give a clear picture of the pattern of disease in the Kampala district in the first part of

this century. In addition he built up a very critically selective library of books and journals, and the library of the Makerere College Medical School was very fortunate when the mission hospital gave to it Sir Albert's books, professional papers, and case notes.

The library is one of the features of the medical school. It is small, compact, highly functional, and run on a very meager budget. The purchase of journals is preferred to the purchase of books, since so many books reflect what has already appeared in journals. A close liaison is maintained with other professional libraries in Uganda and the rest of East Africa. This in some way checks the duplication of necessary but expensive sets of journals as specialized as they are infrequently used. Despite its meager budget, the library is able to serve very adequately the needs of the students and the staff, and it is rare that the research worker, either local or a visiting one, fails to find the research literature which he needs. The student has to be introduced to the concept of a library, but is the professional type of library the proper introduction? Those central stacks with shelves laden with books, and the space between them so limited that there is not even room for a man of pleasant corpulence to turn around, gives a library a forbidding impersonal appearance to the young undergraduate—so much so that many students are frightened away, and those who are not use it as a reading room and not as a library.

The library also provides a postal service for doctors and research workers throughout East Africa, and for some years now efforts have been made to get the library enlarged in space, journals, and equipment, better staffed and better financed, so that it can become the medical research library of East Africa.

To have grown from 200 to 15,000

volumes in fifteen years is quite an achievement.

The advancement of knowledge by original contributions has always been a fundamental function of a university, and medicine has ably shared in this. The new medical school in the new university in the emergent country, if it is to be an integral part of the university, must fulfil this function from the outset. If medicine is to survive as a science its survival depends on finance, leisure, and freedom to pursue research, and every opportunity must be made available for its scholars to associate closely together. Only by such means will concepts be tested and ideas and techniques passed on to each other and to their successors. No new medical school, or any old medical school for that matter, ever has the money it needs; what monies are available are soon swallowed up by the needs of teaching, and research is limited to what can be done with teaching equipment and what can be got from outside foundations, which, happily, are most generous and helpful.

At the outset it is necessary to assess the nature and function of medical research in an emergent country. We must start with a generalization that one of the main functions of higher education in a new country, at least, is to express the needs of the country and, where necessary, to try to resolve these needs by research. Medicine is no exception to this. It is therefore necessary to examine the functions of research.

The modern concept of research is of early 19th century German origin and arose with the growth of experimental science in the universities. The idea of liberal humanism was ousted and replaced by an almost fanatical devotion to the advancement of knowledge, to the concept that any addition to human knowledge is a boon, regardless of its

seeming pertinence or relevance. This was associated with a complete disregard for the practical applications of such knowledge. Helmholtz, in his "Academic Discourse" delivered at Heidelberg in 1862, defined perfectly this attitude:

Whoever, in the pursuit of science, seeks after immediate practical utility, may generally rest assured that he will seek in vain. All that science can achieve is a perfect knowledge and a perfect understanding of the action of natural and moral forces. Each individual student must be content to find his reward in rejoicing over new discoveries, as over new victories of mind over reluctant matter, or in enjoying the aesthetic beauty of a well ordered field of knowledge, where the connection and the filiation of every detail is clear to the mind, and where all denotes the presence of a ruling intellect; he must rest satisfied with the consciousness that he too has contributed something to the increasing fund of knowledge on which the dominion of man over all the forces hostile to intelligence reposes. . . . In conclusion, I would say, each of us think of himself, not as a man seeking to gratify his own thirst for knowledge, or to promote his own private advantage, or to shine by his own abilities, but rather as a fellow labourer in one great common work bearing upon the highest interests of humanity.

It must not be forgotten that this creed enabled its original holders to make very great contributions to knowledge. It was the later followers of this philosophy in Germany and elsewhere in Europe and America who initiated the concept by emphasizing the first sentence of this quotation and ignoring the last.

The demands of technology and the needs for the universities to listen to these demands and to cooperate and in part "to seek after practical utility" has widened the concepts of the real nature and functions of research; but this widening process has not gone as far as we think.

A *Times* leader some months ago, entitled "Research Without Discretion" based on Mr. August Heckscher's—the Director of the Twentieth Century Fund—annual report, shares the director's query on the exacting question of the responsibility of research in contributing to action. The leader talks of the old idea that any addition to human knowledge is of itself a boon, regardless of its seeming pertinence and relevance. A new fact is expected to come in handy like the missing piece of a jig-saw puzzle, when it is most needed. Whether it does or does not becomes for the researcher irrelevant. This may well be a form of escapism. There is, Dr. Heckscher says, the so-called purity of the research worker to be considered, but there is a good deal in his contention that it is a kind of purity which a society in flux should not put too great a price upon. He further says that when research takes on an existence of its own there are subtle degradations which affect the policy-makers no less than the scholars. Research can be another name for procrastination; if pushed far enough it can be an excuse for doing nothing at all.

Research is a good servant, but a bad master. Its techniques must be free. Its conclusions must not be conditioned, but it should have both direction and purpose. These comments are timely and may do something to dispel the air of false mystique which can surround research and do damage to the real research worker. It should help to drag out into the open those who continuously over the years talk of their research but have nothing to show for it.

Whatever the justification for pure abstract research there may be in the older established countries, there is no justification for such research in new countries to the exclusion of the "local" type of research, based on the use of local

material, about which so little is known, but which, when worked on, has already made illuminating contributions to knowledge. There is no sanction for the use of limited research funds for academic research which can be better carried out in the larger research laboratories of Europe and America.

Africa is fortunate that its urgent medical research problems offer possibilities for the combination of both types of research in almost every case, and that has been the pattern of work at the Makerere College Medical School. However, the problems are so great and the staff so limited that one of the basic tenets in the research program of all departments is to make it possible for the visiting scientist to come and help in this work.

The earliest research at Mulago Hospital was by Webb and Halliday on syphilis and Owen on eye conditions. The first outstanding contribution was the historic work by Dr. Trowell on the anemias and nutritional disturbances. Later Davies elucidated many aspects of the pathology of kwashiorkor and brought into line the observations of others and helped to clear up the semantic problem.

At this time Davies had observed a post mortem cardiac condition characterized by fibrous plaques on the endocardium. Out of these observations grew the concept of endomyocardial fibrosis as a pathological entity. Detailed clinical observations were made in the wards, and the clinical picture soon emerged. Since then work on heart disease in all its aspects has been pursued at Mulago Hospital. The pathology of endomyocardial fibrosis, its clinical aspects and diagnosis, and study of the changes in the blood and tissue fluid, the electro and phonocardiographic changes, and the cardiovascular dynamics have been under study.

In 1951 the Faculty of Medicine set up a Cancer Research Committee which

has carried out a variety of researches into cancer in Uganda. This includes the Kampala Cancer Registry set up in 1951, which is now able to produce incidence figures of cancer in Uganda and to publish studies of primary liver cancer, of the pathology and treatment of Kaposi sarcoma, and other tumors. Of outstanding importance is a demonstration by Davies, Burkitt, and O'Conor of the very high frequency of lymphosarcoma mainly in the mandible and maxilla in Uganda African children and adolescents.

Again the physiologist is quite blunt in his main aim in research. He avoids at all costs doing what others can do as well or better anywhere else. Situated as the medical school is in the heart of one of the richest faunal belts in Africa, where tragically the fauna is rapidly disappearing, the physiologist is building up opportunities of applying correct physiological and biochemical and pharmacological techniques to representative species of the African flora and fauna and pursuing in detail certain selected aspects of physiology, biochemistry, and pharmacology. Such work as studies on temperature regulation in the rhinocerus, hippopotamus, and elephant and the comparative studies on the aqueous humor and cerebrospinal fluid and blood from birds and primates have made an impact on the physiological world. Academic studies on the action of many local drugs, especially of the neuromuscular blocking agents and uterine stimulants, have attracted the attention of the larger pharmaceutical houses.

The Anatomy Department work is essentially based on that of the University of Witwatersrand, in that the first thing to be done was to make a physical anthropology collection of known skeletons. This has provided a basis for much work by the anatomy staff and several visiting workers. The department works in

close conjunction with the surgeon, and already studies on joint regeneration have been published. It is a matter for deep regret that an anatomy department so uniquely situated in an area which within a 300-mile radius has representatives of almost every type of old world primate, has done so little in primate research.

Immediately after the war there was set up a Colonial Medical Research Committee under the aegis of the Medical Research Council, which has done very good work within its limited scope in stimulating medical research in the colonies and in stimulating territories or groups of territories to institute councils for medical research. East Africa has such a Council, but it is a curiously feckless body.

Soon after the war the East African territories aided by Colonial Development and Welfare funds set up a series of research institutes scattered throughout East Africa. These came under the control of the East African Council for Medical Research when it was created in 1955. At the outset the parochial jealousies of the territories were such that they ignored the advice from England that these should be closely associated with the new university. Money urgently needed for actual research was put into buildings. Only one of these institutes is really viable—the East African Virus Research Institute—and very much so, but the others are very weak and sickly. The upkeep of buildings drains away much money, and there are great staffing difficulties. The result is that the real potential of the research institutes is not being fully exploited.

It is a great pity that from the outset these research funds were not used to finance outside research workers to work on specific problems in East African

laboratories; this would have resulted in all probability in real contributions being made.

Recently the Colonial Medical Research Committee has been dissolved, and a new Tropical Medical Research Board has been set up jointly by the Colonial Office and the Commonwealth Relations Office. It had been hoped that this new organization would bring new life into East African medical research, but this may not be so. It is now feared that the very name of the new organization and the constitution of its committee mean that emphasis will still be laid on tropical medicine *sensu strictu* and that the great and exciting problems of health and disease envisaged in the term "medicine in the tropics" will be ignored.

On the other hand, however, the Medical Research Council has the Infantile Malnutrition Unit situated very close to the medical school at the hospital. Its Director, Dr. Dean, has been a great stimulus to medical research, not only by his own research, but by the help and encouragement he has given to others and their work.

The Infantile Malnutrition Research Unit of the Medical Research Council was founded in 1953. A single building, given by the Nuffield Foundation, houses a hospital for ten to twelve children, a series of laboratories for biochemical studies, rooms for chemical and anthropological investigations, and an experimental kitchen.

Anthropological investigations may sound odd in this context, but they were very necessary. In this context, as in every other context, little or nothing is known about normal African standards. Dr. Dean's work required accurate information on the maturation status of his young patients. Actual age has no real comparative significance. His first task, therefore, was to undertake maturation studies so that accurate compari-

sons could be made—one child with another, one group with another, and one race with another.

The long-term aim of the Unit is the prevention of kwashiorkor, and a mixture of foods available locally (peanuts, maize flour, cottonseed oil, cane sugar, and dried skimmed milk) has been developed to the stage at which cheap commercial production may soon be possible. The mixture, which is made into a dry powder, can be used as a complete diet when stirred into water, or as a supplement to any home diet. It has been given extensive trials in the Unit's wards and at the Unit's rural Child Welfare Clinic.

The treatment of kwashiorkor with high-calorie diets has been standardized, and most cases can now be cured. The methods have been reduced to their simplest and most practicable terms, with the needs of poorly staffed hospitals in mind, and through the Uganda Government Nutrition Unit, which is closely allied to the Medical Research Council Unit, they are being introduced throughout the Protectorate.

Much work has been done on the biochemical changes that are caused by kwashiorkor, especially in the enzymes and other constituents of the serum, and the recent discovery of excessive nitrogen losses in the urine in the acute stage of the illness has led to the isolation of a series of compounds, probably breakdown products of ribonucleic acid, that are believed to be purines not previously found in biological fluids. They appear in greater quantities, the more severe the condition, and may be of fundamental importance to the understanding of the course of the disease. The identification of the compounds is being carried out with the help of the National Institute of Medical Research in London.

As in all underdeveloped countries, there is great need in Uganda for stand-

ards of growth and development. The healthy newborn child, and the healthy child at all ages up to 16 years, have been investigated in considerable detail. Two of the most interesting projects have been the establishment of the extraordinary precocity of the African child at birth and the 6-year longitudinal study of schoolchildren by somatotype photography, with supporting radiological examinations of the bones. The results have given added value to the Unit's follow-up of children who have been treated for kwashiorkor in the past 7 years. They have shown the extent to which recovery from the arrest of growth caused by the episode of malnutrition may occur and suggest that some of the effects may be permanent.

The severe psychological changes in kwashiorkor (with their attendant changes in the electroencephalogram) have been investigated, and have led to various studies of the psychomotor development of the young child, especially in relation to the manner, traditional or not, in which the child is brought up, and to the separation from the parents that is usual in the local society.

The Unit tries to consider the whole child in relation to his environment, and in recent years has devoted much attention to the background of malnutrition of the individual. Much information has been obtained on child-rearing practices and on the economic, social, and medical aspects of the families that produce children who develop kwashiorkor. It is clear that in Uganda the disease and its eradication are a deep-seated ecological problem for which no facile solution is likely; poverty plays only a minor role.

Undergraduate medical education is now relatively stable, and the next development will be in graduate education in medicine. Although this seems the orderly, tidy pattern of development, in

practice it may not have been a good one. Although we have, in the main, mechanisms for replacing the expatriate medical officer with his African counterpart, little or nothing has been done to replace the expatriate specialist and teacher. This is a matter of real urgency, and already it may be too late. Hitherto the individual has been selected and sent overseas to study for a higher qualification. Each East African territory has its adviser to students in England, but he is a layman. If he has had any university training or research experience that is purely adventitious. In general he lacks that detailed knowledge of universities and their professional schools, and no matter how industrious and courageous the individual is this lack is a very limiting factor in his performance.

The young African doctor trying to study in England may find himself in great difficulties. He can get advice and help on personal and domestic difficulties from his territorial adviser to students, but help from difficulties arising out of his studies can be very sporadic, dependent on some kind individual's taking an interest in him. Under such conditions it is no wonder that the results are very poor; at least 2 years for the primary examination for the F.R.C.S. and anyone's guess for the M.R.C.P.

Another factor in the urgent need for a local postgraduate medical education scheme is our great scarcity of doctors. In any training scheme it is an advantage if the trainee can take his share in the curative work of his specialty, in addition to his studies. Such a scheme has recently been initiated by the Post-Graduate Training Council of the Ministry of Health in Uganda. This scheme means that while the individual is receiving training he is also available for work in the hospital, even if he is only on half duty. This helps the running of the hospital and also helps the individual,

in that he is not divorced from the practical side of his work. The scheme is excellent in principle, but it falls down on several counts—the main being that the teaching departments in the medical school have minimal staffs, just sufficient for undergraduate needs, and are quite unable to face the additional load of graduate training and can only offer advice. So the young doctor still gets no real help. The prospects of promotion in University work in East Africa are limited, so the young teacher's prospects of promotion depend more than elsewhere on his research if he is considered for posts outside East Africa. To load heavily such an individual with teaching duties would be very unfair, since his future would be being jeopardized.

Another reason why this post-graduate training scheme has not had the success it deserves is that it is run by and controlled by a body outside the Medical Faculty on which the Faculty has very limited representation. If postgraduate training were regarded as a function of the Medical Faculty Board, and if the departments concerned with such training were strengthened in staff, a constant flow of young specialists and teachers would be being turned out after a year or two.

However, more thought will have to be given to the functions of advanced medical education, and the part a university should play in fulfilling these functions. On the one hand there are those who see postgraduate education as a series of cram courses designed for the purpose of examinations. This group is not in any way perturbed that such a training usually means that individual study ends when the hallmark is stamped after the name of the successful candidate. It has been said, as a superficial generalization, that one can tell the date, within a few years, of his passing his

higher examinations, from the nature of his professional conversation.<sup>1</sup> At the opposite pole from this are those who regard the higher reaches of medical education like the higher reaches of all other branches of learning, as a lifelong study in which the passing of examinations is incidental. Of course, as with everything else, the truth lies between these two extremes.

It is clear that for some time to come East Africa will be unable to give all the postgraduate education which is required, and that doctors will have to be sent elsewhere to complete their studies. Physiology and pathology, with anatomy, form the basis of almost every branch of postgraduate study, and with some addition to the staffs of these establishments there is no new colonial medical school which could not give all the teaching in those disciplines which is required. It is the advanced clinical training which can present difficulties. It is essential that part, at least, of this clinical training should be done overseas, so that the practical side of the wider picture of clinical experience can be appreciated, and that that polish, which is only obtained by contact with a diversity of people, is achieved.

It is expected that the next few years will see a Federal University in East Africa with three constituent University Colleges in Uganda, Kenya, and Tanganyika. The precise scope of the new Uni-

<sup>1</sup> An interesting commentary on the value which clinicians really place on the need for an understanding of physiology and biochemistry was indirectly revealed recently, when an eminent clinical scientist received a high honor. The citation for this honor contained the following: ". . . One of his greatest contributions, less tangible but possibly more significant than any discrete discovery, has been the introduction of clinical physiology to a generation of physicians in Britain and the Commonwealth . . . he has taught and encouraged the principle of studying disordered function in patients using basic physiological techniques."

versity Colleges has not been decided, but it is expected that each will have its Arts and Science Faculties. Kenya will have engineering, architecture, and accountancy; Tanganyika, law; while medicine, agriculture, and education will remain at Makerere. It is hoped that the professional schools will be on an interterritorial basis for some time. Professional schools are expensive, and the maximum benefit must be derived from each one of them before its counterpart is set up in another territory. Another medical school is not needed at the present time and will only be required when the present one has an output of some 60 graduates a year. A medical school of this size seems a most convenient size both from staff and students' point of view. Even if there were good reasons for a larger school, one factor alone would militate against this reason. A medical school has a great influence on the hospital it uses and raises the hospital standards in every direction. These higher

standards are spread throughout the country by example and are maintained and annually refreshed and heightened by the example of recent graduates who go to work on the periphery. Hence, when economic use is made of a staff, equipment, and buildings—that is, an output of 60 graduates—a new medical school in another territory will be timely and beneficial.

This, then, is the first chapter of a very exciting story. What the subsequent chapters will tell is difficult to forecast. There are the pessimists who say that when self government is achieved there will be a general lowering of objectives with a resultant lowering of standards; but there are those who are convinced that such is the value set on health and education that the present standards will not only be maintained but advanced even further. It was against such a background of faith that the work outlined in this first chapter was undertaken.

## The 1960 Medical School Graduate: His Perception of His Faculty, Peers, and Environment

EDWIN B. HUTCHINS, Ph.D.\*

Association of American Medical Colleges, Evanston, Ill.

In general the learning enterprise is one designed to bring about a more or less permanent change in behavior as a result of experience. In medical education specifically the changes in behavior of concern are those characteristic values and attitudes, areas of knowledge, methods of problem-solving, and the skills, techniques, and clinical proficiencies that go to make up the various roles of the professional physician. The in-put for this enterprise are the personalities of undergraduate students as they present themselves for admission with a wide diversity of abilities, interests, and personality patterns. Just as the makeup of the medical student varies from individual to individual so too does the environment to which he comes to learn to be a physician. This environment varies obviously in terms of physical plant and research and hospital facilities, but more importantly, perhaps, it varies in terms of the caliber and attitudes of the faculties.

In addition, these differences are often exaggerated or altered in terms of how the student perceives them as a function of his own unique need system. Perception we know is rarely, if ever, isomorphic with reality; but we know, too, that an individual's perception of the learning situation is an important determinant of any changes that do take place in his behavior.

In support of this, Thistlethwaite has found undergraduate student's perceptions of their colleges to be related to the school's production of future Ph.D.'s. As an example, faculties in institutions sending a high proportion of their graduates on for Ph.D.'s in the natural sciences were perceived by their students to be informal and warm in their contacts, and to emphasize high academic standards. Schools low in Ph.D. productivity in the natural sciences had faculties who closely supervised their students and who were more directive in their teaching methods (2).

In the field of medical education a consideration of such environmental variables is equally important to an understanding of academic success, attainment of clinical proficiency, or the choice of a specific career. The data presented here represent an attempt to analyze and describe those situational determinants contributing to changes in medical students attitudes, values, and behaviors.

These data were collected in the context of the AAMC's longitudinal study of the abilities, interests, and personalities of the 1956 entering class. At the time of the data analysis questionnaire information had been received from 1901 students in 25 of the 28 participating medical schools.

The instrument used to identify student cultures and faculty characteristics was the Medical School Environment Inventory adapted in part from the Stern

\* Research Associate, Association of American Medical Colleges.

TABLE 1  
ILLUSTRATIVE ITEMS FROM EIGHTEEN MEDICAL SCHOOL ENVIRONMENT PRESS SCALES

SCALE NO.	CONSTRUCTS	ILLUSTRATIVE ITEMS
Faculty press scales:		
1	Affiliation	"Faculty members are typically friendly and sympathetic in manner."
2	Directiveness	"The goals and purposes of the work are clearly defined for the student."
3	Enthusiasm	"Faculty members put a lot of energy and enthusiasm into their teaching."
4	Achievement	"Faculty members here really push the students' capacities to the limit."
5	Compliance	"Students quickly learn what is acceptable and what is not acceptable in this school."
6	Supportiveness	"The faculty is very supportive at the time when the student first begins to assume patient responsibility."
7	Humanism	"The faculty here stresses the study of the patient as a whole person."
8	Independence	"The school actively encourages students to undertake independent projects or theses."
9	Pragmatism	"Education here tends to make students more practical and realistic."
Student press scales:		
10	Academic achievement	"Most students here are genuinely interested in studying and learning."
11	Aggression	"Students exhibit a very authoritative attitude in the presence of patients."
12	Breadth of interests	"The environment of the medical school stimulates interest in things other than pure medicine."
13	Competition	"The competition for special honors is very rough."
14	Humanism	"Most of the students here are concerned with the patient's personal problems as much as with the disease with which he is suffering."
15	Participation	"Medica students participate in all aspects of University life here."
16	Reflectiveness	"Serious philosophical discussions are common among the students."
17	Scientism	"There is a lot of interest in the philosophy and methods of science."
18	Social conformity	"Proper social forms and manners are important here."

and Pace College Characteristics Index (1). The Environment Inventory is a 180-item questionnaire comprised of eighteen *a priori* scales of ten items each. Nine of these scales are descriptive of faculty behaviors or pressures, nine identify characteristics of the student body.

The items from the various scales are randomly distributed throughout the questionnaire, and the student is simply asked to rate the statements according to his opinion of how true or false the statement is about his medical school. Responses were scaled so that 1 indicated false, 2 more often false than not,

3 more often true than not, with 4 equaling true. The ten items of a scale were then averaged to give a scale score representing that student's perception of his school environment on that particular attribute.

To obtain a school score on each of the eighteen scales the individual student scores were averaged for that school. Finally, descriptive information on medical schools in general was developed by averaging the 1901 subjects to obtain grand means on each of the eighteen scales. The schools are a representative sample of all U. S. medical schools, care having been taken when the study was originally designed to obtain a stratified sample in terms of tax or private support, geographic region, and ability level of the student body.

The constructs used to describe faculty

behaviors and peer group pressures are listed in Table 1, along with an illustrative item from the scale measuring that construct.

A first question to consider in analyzing these data was whether there were indeed significant differences among the schools on the eighteen scales. That is, we wanted to know whether the variations between the schools were in effect greater than the variations among the individual student's perceptions within any given school. In answer to this we found statistically significant differences on all eighteen of the variables. Thus, the between-schools variance was significantly greater than the within-schools variance, and we can assume that all of our eighteen scales do measure differences among the 25 schools.

The statistical significance should not

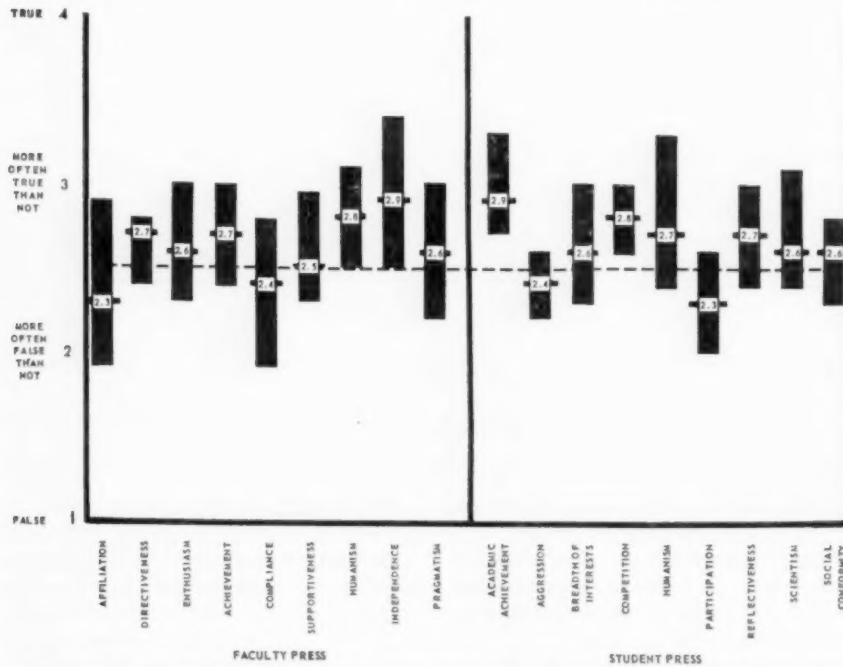


CHART 1.—Distribution of average scale scores for 25 schools on the medical school environment inventory.

necessarily be construed to mean that differences of practical or predictive value exist between schools on all of these variables.

In Chart 1 we have the average profile based on the responses of our 1901 subjects. The mean response for each scale is given in the center of the bar, and the length of the bar indicates the range from the lowest school mean to the highest school mean. In general, this profile indicates that medical students see their faculties as somewhat lacking in affiliative behavior toward students, directive and demanding of achievement but with a humanistic outlook and a desire to foster independence among their students. On the average, students regard as neither decidedly true nor false statements about the enthusiasm of their faculties or about faculty pressures for compliance to rules and regulations. Nor were there particularly emphatic reactions in general to items on faculty supportiveness or pragmatic orientation. However, the average ratings of faculties of individual schools varied considerably, and perusal of individual school profiles yields interesting and strikingly different descriptions of specific school environments.

Looking at the right half of the profile we find the medical student's peers perceived as competitively striving for academic achievement in an atmosphere where the students maintain a reflective and humanistic outlook with minimal participation in social activities and affairs other than medicine.

We noted above that the in-put for the medical school is a varied collectivity of personalities with diverse abilities, interests, and backgrounds. One change of importance to which the medical school environment will contribute will be the students' selection of a specific career in medicine. In relating measures of school environment to this particular outcome, i.e., career choice, it must be

kept in mind that the present criterion of career choice is based on questionnaire information obtained in the last year of medical school. Previous research indicates that many shifts in stated preference will take place during the internship. In light of this, further career choice data are currently being collected on the present sample. Nevertheless, it is of interest to note that, over-all, three-fourths of the students did not decide on their chosen career until they were in their last 2 years of medical school. It is a reasonable assumption then that, in addition to financial and personal factors, such as marriage, the individual's career choice is molded in part by his medical school environment or, more precisely, by his perception of this atmosphere.

To study this question, we asked first whether the schools differed in terms of the proportion of students they turned out in each of four major career areas: general practice; specialty practice; research and/or teaching; and a combination of specialty practice, research and/or teaching. This question and the over-all responses to it are given in Table 2. The proportion of students responding for any given school ranged from 0 to 40 per cent for general practice, from 18 to 45 per cent for specialty

TABLE 2  
PER CENT RESPONSE TO QUESTION 9, 1960  
SENIOR QUESTIONNAIRE:

"Check the type of practice to which you think you will ultimately devote all or most of your time."

Per cent responding to each category	Type of practice
17.7	1. General practice
38.7	2. Specialty practice
3.0	3. Research and/or teaching
36.6	4. Combination of specialty practice, research and/or teaching
.9	5. Other (specify)
3.1	No Response
100.0	Total

TABLE 3  
RANK ORDER INTERCORRELATIONS AMONG  
PROPORTIONS OF STUDENTS WITHIN A SCHOOL  
CHOOSING ALTERNATIVE TYPES OF PRACTICE  
(N = 25 SCHOOLS)

	Specialty practice	Research and/or teaching	Combination specialty practice/research and/or teaching
General practice	+.43*	-.52†	-.87†
Specialty practice		-.29	-.77†
Research and/or teaching			+.49†

\* Significant at the .05 level of probability.

† Significant at the .01 level of probability.

practice, from 0 to 10 per cent for research and teaching, and from 11 to 76 per cent for a combination of teaching and practice. Thus, the schools do differ considerably in this way.

We then looked at the interrelations of these choices in Table 3 and found that the schools tending to yield the highest proportion choosing general practice also had the highest proportion interested in specialty practice. On the other hand, schools turning out the largest proportion of teacher-researchers also had the highest proportion choosing a combination of practice and teaching and also the lowest proportions of their students checking the general or specialty practice items. On the basis of this, the 25 schools

were then divided into three clusters. The first cluster included ten schools having above-average proportions of students choosing general or specialty practice and below-average proportions choosing the research or combination alternatives. These we considered to be schools turning out students with a predominantly *clinical orientation*. The second cluster included ten other schools with the reverse pattern, i.e., above average in proportions of students choosing research-teaching and practice plus teaching careers. These ten schools we regarded as having a predominantly *research and teaching orientation*. The remaining five schools did not clearly fall into either pattern and were designated of *mixed orientation*. The contributions of each of these clusters to the four types of practice are summarized in Table 4.

Before looking at the way in which these clusters differ on the scales of the Environment Inventory, we might first note how they differ with regard to three major variables used in stratifying the original sample of schools. These data are given in Table 5. The ten research-and teaching-oriented schools are predominantly privately endowed, geographically tend to be located in the Northeast, and all have student bodies above average in ability. In contrast, eight of the ten schools with a clinical

TABLE 4  
PER CENT CONTRIBUTION OF SCHOOL CLUSTERS TO TYPES OF PRACTICE ANTICIPATED

Schools with clinical orientation (N = 10)	General practice (per cent)	Specialty practice (per cent)	Research and teaching (per cent)	Combination R & T/Spec. P. (per cent)
Schools with research and teaching orientation (N = 10)	13	25	50	53
Schools with mixed orientation (N = 5)	19	22	29	22
Totals:	100	100	100	100

orientation are tax-supported, all are located either North Central or South, and seven of the ten have student bodies below average in ability. These differences should be kept in mind as we now look at the other environmental differences between the two major clusters. These differences are graphically presented in Chart 2.

The most important differences in the faculty measures and the only two that were statistically significant were in the press for compliance and the press for independence. In contrast to the clinically oriented schools, students in schools oriented toward research and teaching tend to perceive their faculties as less concerned with specific rules and regulations, less inclined to monitor the students closely, and willing to permit students to set their own pace and to engage

TABLE 5  
DISTRIBUTION OF THREE SCHOOL CLUSTERS  
BY SUPPORT AND REGION

	Clinical orientation	Research and teaching orientation	Mixed orientation
Support:			
Tax	8	2	2
Private	2	8	8
Region:			
Northeast	0	5	0
North Central	5	2	3
South	5	1	0
West	0	2	2
Average school MCAT:			
Above grand mean	3	10	3
Below grand mean	7	0	2

in independent and individually creative activities.

With regard to the peer environment, statistically significant differences were obtained on five of the nine scales. Here

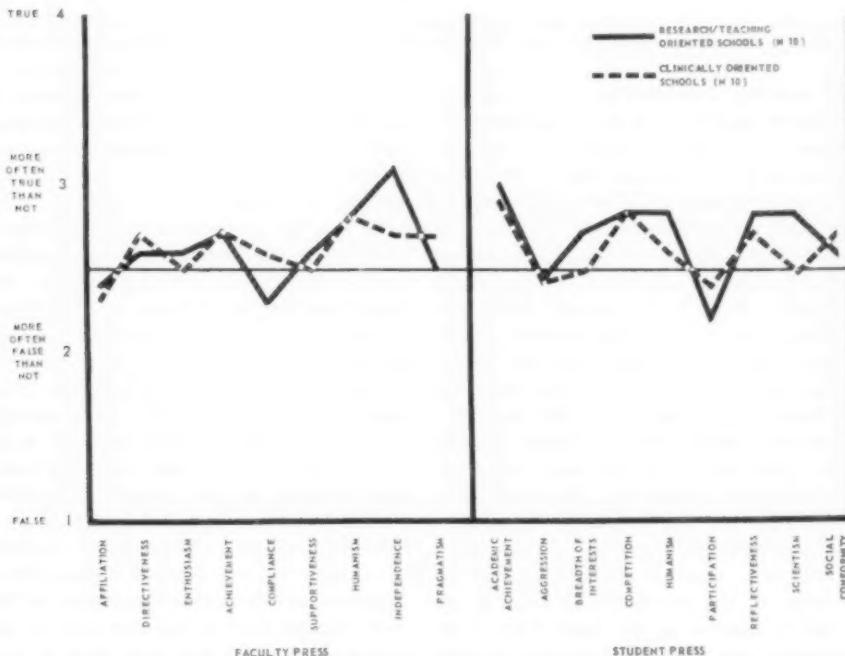


CHART 2.—Comparison of clinically oriented graduating classes with classes oriented toward research and teaching on eighteen environmental press scales.

TABLE 6  
MEAN SCORES FOR THREE SCHOOL CLUSTERS ON EIGHTEEN MEDICAL SCHOOL ENVIRONMENT INVENTORY SCALES

	Schools with clinical orientation (N = 10)	Schools with research and teaching orientation (N = 10)	Schools with mixed orientation (N = 5)
<b>Faculty press scales:</b>			
1. Affiliation	2.27	2.40	2.38
2. Directiveness	2.73	2.63	2.69
3. Enthusiasm	2.53	2.64	2.66
4. Achievement	2.71	2.75	2.71
5. Compliance*	2.61	2.26	2.31
6. Supportiveness	2.48	2.62	2.63
7. Humanism	2.83	2.85	2.80
8. Independence*	2.74	3.13	2.96
9. Pragmatism	2.69	2.52	2.66
<b>Student press scales:</b>			
10. Academic Achiev.*	2.89	3.03	2.83
11. Aggression*	2.44	2.37	2.47
12. Breadth of Interests*	2.53	2.69	2.57
13. Competition	2.83	2.81	2.82
14. Humanism	2.63	2.78	2.63
15. Participation*	2.41	2.24	2.32
16. Reflectiveness	2.66	2.76	2.60
17. Scientism*	2.50	2.83	2.60
18. Social Conformity	2.68	2.61	2.55

\* The clinically oriented cluster is significantly different from the research and teaching-oriented cluster on these variables by Wilcoxon Test of unpaired replicates.

we find the clinically oriented schools with less press for academic achievement among the student bodies than the research-oriented schools but with more aggressive behavior being manifested. In addition, they show less in the way of breadth of interests but maintain greater participation in activities peripheral to medicine. Finally, the largest difference obtained on any of the student press scales seems to characterize the major difference between the two clusters. The students themselves in the ten research-oriented schools tend to foster an environment which places high value on the scientific enterprise. Whereas other differences are observable, these appear to be the outstanding ones.

However, one of the difficulties in looking at the environment data in so gross a fashion as we have here is in ignoring the fact that many of the schools we have categorized in one clus-

ter or the other are made up in reality of many smaller but nevertheless integral sub-environments. All schools are to a greater or lesser degree of the "mixed" variety in terms of the products they turn out. The student who takes his clerkship in internal medicine at one hospital under one staff is not subjected to the same learning experience as his fellow student who takes his clerkship in the hospital on the other side of town, even though they are both enrolled in the same school. At the same time a third student is receiving special attention from three or four faculty members on an independent research project, whereas a fourth is forced to engage himself as a part-time extern. These four students, all enrolled at "school X," will respond differently to questions about their environment. While they will all have a common core of experience, more unified than that of students from another school, they will,

nevertheless, differ in the way they perceive their own unique environments and often for good reasons. Therefore, dramatic or significant differences on some of our press scales may have been obscured by the fact that in these analyses we assumed each school to have a more homogenous environment than may in fact be the case.

The students do agree in their ratings of their schools to the extent that significant differences between the schools did obtain on all of our eighteen press scales. However, when it comes to relating the student's perceptions of their environment, their faculties and their peers, to outside criteria such as career choice or academic success, it becomes important to account also for some of the variations in the learning environment within the specific schools. Thus schools with proportionately more students turning to the research and teaching role were also observed to have faculties who were somewhat more *affiliative* and *supportive* to their students, who were *enthusiastic* about their own teaching role, an enthusiasm evidently transmitted to their stu-

dents, and somewhat less *pragmatic* or practical in terms of relating the medical school experience to the eventuality of clinical practice. Coordinately these schools had student bodies slightly more humanistic in outlook and more reflective in their approach to problems. Although these differences were not statistically significant it will be necessary in subsequent studies to look at the individual's own career choice in relation to his personal perceptions of his own unique environment, even though they may not entirely agree with the perceptions of his classmates. When we then include his measured personality characteristics, his abilities, and his pattern of interests we will begin to approach some understanding of the complex process of interaction between the medical student and his environment.

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## Medical Impressions from India and Nepal\*

ROBERT C. STEVER

University of Pennsylvania, Philadelphia, Pa.

With enthusiasm I relate to you some of the impressions and facts which evolved this summer from an unusual 15-week Smith, Kline and French Medical Fellowship to India and Nepal. The events discussed will be selected examples, since so much resulted from this trip that I will be years integrating these thoughts stimulated by interesting and different cultures, art, philosophies, religions, and, above all, genuinely fine people.

My first medical impression began in Karachi during a brief stopover at the civil hospital. This government-subsidized school and 1,200-bed hospital is attempting to meet the needs of 2.5 million people. The overworked staff make every attempt to see that everyone receives some medical treatment, but it is most difficult when 3,500 patients swarm into the hospital each day for 5 hours, and, of these, 800 selected patients are seen by two medical and two surgical doctors. These conditions worsen each month owing to the population explosion.

With such a population explosion it seems that bad conditions create worse conditions. The educated and wealthy find the problem hopeless and tend to ignore it completely. The poverty of the people is increased by a climate necessitating a sluggish life with a decreased productivity. Dishonesty is subsequently aggravated, which provokes contempt from the rest of the world, thus negating charitable feelings or even the desire to have any business dealings. Conse-

quently, such a cycle of degeneration contributes greatly to the lack of public health. Worse, however, it appears almost impossible to break this cycle, because such societies become as stratified as the societies of the ant—each caste-like division has a certain time-tested chore to be done without question. Over the ages society has found that this at least produces a basic living with minimum chaos. The sweeper sweeps and remains contentedly in the untouchable caste, for it is his only hope that in the next reincarnation he will be one caste higher. Even worse, he dare not break caste by trying to improve his lot or he may be reduced in caste.

The first 7 weeks were spent in Mussoorie, a town 7,000 feet high in the Himalaya. Here houses barely cling to steep cliffs, and the narrow trails bustle with Nepali, Tibetan, Indian, and Western people. Sixty miles to the north are the eternal snows, and to the south are the hot, disease-ridden plains of India.

With the help of strong coolies, their bare feet calloused, my luggage was moved to the hospital. Along the steep way a school boy was noted, books under one arm, clinging to a steep slope letting a watery stool squirt down the wet hillside to the much traveled road below.

The Landour Community Hospital, a neat 70-bed hospital admitting 80 per cent natives and 20 per cent westerners, was at the very peak of the busy season. It was a challenge to be the only assistant to the only surgeon and doctor of the hospital, Dr. Wayne Wertz, a most capa-

\* Smith, Kline, & French Foreign Fellowships, June to October, 1960.

ble Board-certified surgeon from the U.S. and a very enthusiastic teacher. A typical day began with early rounds before the morning surgery, followed by afternoons of histories and physicals on the new admissions, work-rounds, x-ray reading, and evening teaching rounds. During this period 60 operations were most capably performed by him. Lithotomies were very frequent, complementing the historical tradition that India has the highest world incidence of bladder stones. This may be due to the diet which increases the acidity of urine, the hot climate contributing to dehydration, or to the small fluid intake especially during illnesses when some mothers withhold fluids completely. Interestingly, appendectomies are extremely rare among the native population.

Parasites caused frequent medical admissions, especially amoebiasis, one of the commoner causes of G.I. distress. Such a case was a beautiful 34-year-old Tibetan woman, mother of six children, Chhunga, who came to the hospital acutely ill from an amoebic abscess of the liver. Chloroquin only decreased her already poor appetite, and heart failure developed on emetine treatment. So much diaphragmatic discomfort was experienced that it was most difficult to prevent orthostatic pneumonia. Initially the abscess was aspirated of 500 cc. of anchovy-paste pus, then drained for 5 days, yielding 2500 cc. Later, another fluctuant mass was palpated below the liver and, on surgical incision, easily 2500 cc. of pus shot across the room. Chhunga improved. Several abscesses from metastatic amoebae were drained on her arm, and later an acute hepatic flexure obstruction occurred due to the adhesions, but this was relieved by manipulation under fluoroscopy, and Chhunga eventually recovered.

It was interesting to note the great frequency of osteomyelitis in children.

Many had cut their bare feet with thorns or stones. The septicemia and osteomyelitis which so frequently followed the cuts had a very slow response to treatment.

Tuberculosis was probably the most chronic problem. Most patients came to the hospital only if the disease process involved the G.I. tract, the vertebrae as in Pott's disease, or if there was a draining cold abscess such as sometimes occurred with scrofula. Pulmonary cases were discovered incidentally to other diseases, so every cough was regarded with great suspicion. In the cases that I did see it seemed amazing that the people didn't have more complaints, for most of these cases had considerably advanced tuberculosis. Convincing them that they needed expensive, long-term therapy was a great difficulty, but those who had been on the new drugs for tuberculosis had responded very well over a period of a year. One of our greatest diagnostic



FIG. 1.—Malnutrition and dehydration due to neglect.

problems was abdominal tuberculosis in little children. However, after ruling out most of the other causes for G.I. distress we were only too frequently left with this diagnosis, usually supported by a history of chronic distress and a doughy distended abdomen. Almost all the children responded quickly to treatment.

The first encephalitis I had seen was most tragic, because it occurred in beautiful 15-month-old twins, children of a Swiss missionary who was translating the Bible into Tibetan language. In relatively civilized Mussoorie, by comparison with the adverse conditions in which they had lived, there was absolutely nothing that could be done. For 10 days both had had a mild diarrhea which didn't respond to sulfaguanidine. There were some bites on their legs and some irritability, but both had been playing actively the day it struck. Then suddenly at 2 A.M. one uttered a small cry, followed by loss of consciousness. Depth and rate of breathing slowed until 7 A.M., when there was a gasp, convulsion, and death. The second twin was rushed to the hospital where a spinal tap showed no abnormalities. Irritability increased, but she slept well until 6 P.M. when she suddenly started to breathe irregularly though her airway was quite clear. Heart rate slowed and developed an irregular rhythm. Adrenalin and artificial respiration invoked some rally, but by 8 P.M., she too convulsed and suddenly died. Post mortem spinal fluid was bloody, and a pathological report from Vellore showed polymorph infiltration in the brain tissue as well as changes consistent with encephalitis. Viral typing was not possible.

Little Mintu, a boy of 3, was admitted with a fracture of the second cervical vertebra after falling 20 feet onto his head. The local government hospital had refused to admit him. After good nursing care and immobilization with Crutchfield tongs, Mintu regained consciousness

finally after 3 weeks and responded readily to commands. His bilateral wrist drop gradually improved, though his speech remained impaired.

Few deliveries were participated in because the Indian women insist on delivery by midwives. At 3 A.M. one morning, however, I was the only person available. Sleepiness vanished when I discovered a double footling breech, muchal cord, prolapsed and isohemic foot in the baby of a primagravida woman. The patient decided that she wasn't going to be delivered by a man, so there was a minor skirmish while applying the sterile drapes. However, nature took its course, and after a really difficult delivery, the baby did well.

Rounds were only too colorful, since, in addition to the cheerful patients and laughing children, one usually found a relative or two encamped by the bed on a straw mat. Mixtures of Tibetan clothing, gold ear, nose, and toe rings were commonly worn. In one dark corner we always stumbled across a little 2-year-old boy squatting on his hunkers and looking bug-eyed at the activity in the hall. No matter how often he was secured in his room, he managed to remove all his clothing and escape into the hall.

Speaking of squatting, the physiological mechanism made one wonder. One finds people from childhood on in this bird-like position for hours—men on curbstones, door sills, women on the ends of beds and floors. Why the popliteal arteries and veins of the knees aren't occluded, squashed, and end up with aneurysms is a mystery to me, but one seldom found any circulatory disturbances around the knee or in the legs.

Last year the Dalai Lama established a school for Tibetan Refugee Children in Mussoorie, and we were seeing some of their medical problems at the hospital. In walking from Lhasa to India through the rugged Himalaya passes, 30 per cent died.

The others had some tuberculosis, infectious dermatitis, conjunctivitis from the smoke of the confined campfires. They also had little resistance to the Indian tropical diseases, and thus were susceptible to malaria, much bacillary and amoebic dysentery. Though most had lost their parents and had been living under the worst conditions, we were still met with big cheerful smiles and bouquets of flowers freshly picked from the fields. Enthusiasm for their school studies were almost unbounded, and in a very short while many had learned some English. However, they will be needing much help for awhile, for housing is very crowded, food limited, and warm clothing non-existent. Funds were short for medicine, though Smith, Kline and French generously donated a supply of medicine for their dermatitis and conjunctivitis ("Pragmatar" ointment, Cloromidon, 3 per cent Vioform, and Bradex Vioform).

The tales of life in the Tibetan capital of Lhasa, the arrival of the Red Chinese, escape into India made histories most interesting as well as sad when one would hear of wives and children who had not been able to escape, or of the genocide practiced by the Red Chinese.

Nepal, roof of the world, was where I spent the second part of my medical adventure. This ancient country has only been open to the world since 1952 when the king and his people overthrew the reigning Rana family. It's a unique country where White European Stock (the Brahmin Caste), Mongolian, and Indian stock have lived together for 3,000 or more years. Varied customs from thousands of years ago are still everyday habits. Even the wheel is scarcely known, since it was first seen on the airplane. Trails are too steep for roads, though several road projects are now on paper; 76 per cent of the country is mountainous as well as 24 per cent of Tarai, a strip of steaming jungle and malaria country separating Nepal from India and one of the chief causes for the isolation of Nepal from the Indian culture until recently. Only a special caste, Tharu, lives there readily, and there is some suggestion that they are partly resistant to malaria and Kala-azar.

Medicine, thus, has arrived in Nepal only in the last 7 years. In Kathmandu, ancient capital, is Shanta Bhawn, a beautiful 130-bed hospital, an old Rana palace, rented from the Rana family by the United Medical Mission to Nepal. Dr. Bethl Fleming, Drs. Edgar and Elizabeth Miller, Drs. Anderson and Dicke do an excellent job meeting the 80-100 outpatients a day without lowering the high standards of medicine. The civil hospital is now in operation, and the Russians, besides contracting to build some roads, have permission to build a hospital. At Pokhara is the hospital of the Shining Light, so known by the natives because



FIG. 2.—Tibetan woman and wares in Mussoorie, India.

aluminum quansit huts had to be used to avoid foundations, an ancient symbol of possession of land. Here one is only 15 miles from towering Himalaya, Anapourna (means bowl of rice), 26,492 feet, and the Fishtail, 23,000 feet—nearly 5 vertical miles of snow-covered rock.

Tansen, location of my project in Nepal, was to be reached only by a very exhausting 16-mile hike over 4,500-foot mountains. My exhaustion was sharply contrasted by the powerful coolies who plod over the rugged trails carrying up to 200 pounds. On the last stretch I even had to give the camera to my little 12-year-old coolie. In the clinics these coolies might complain a bit of shortness of breath at the top of the hill, and an x-ray might show three-fourths of their lung capacity involved with tuberculosis, but back to the trails the next day. Thus, I arrived in Tansen exhausted, but cheered by the cool climate at 4,500 feet, sweeping views of snow ranges, and the deep green valleys etched into geometrical patterns by generations of farming families toiling each rice season to make paddies. However, first impressions are dangerous. True, the handsome faces of the people were cheerful, but from a public health and medical point of view conditions were primitive.

Little villages are composed of a dozen or so thatched huts built of a mixture of cow dung and mud (the dung makes it adhesive while apparently keeping mosquitos away, so the new hospital found it effective enough to use it as plaster on the walls). The family lives on a cow dung floor of this one- or two-room hut. In the corner is a chula or fire pit without a chimney, which spews forth a thick and irritating smoke. Overhead are some bits of goat meat hung out to be smoked—along with the family who usually have a chronic conjunctivitis and bronchitis due to this custom. Beds are straw mats which are rolled up during

the day so that the lady of the house can plaster over yesterday's dirt with a fresh layer of dung and mud. As four or five naked children—or just wearing shirts so there is no diaper problem—scramble about the mother, she may grind by hand some corn or rice for bread or weave some cloth on a hand loom. In the middle of food preparation she may wipe the bottom of the youngest child who has just defecated a wormy, watery stool, and then splash her hand with some water. The worms just crawl away or get trampled on by the romping children. Then she is back to the hard job of making food. Perhaps she will take a short toilet break and go to the edge of the road, for toilets are not available in most homes. Then with the children in the custody of the oldest child, mother trundles off to the rice paddy to help plant or harvest. By evening she returns with a copper pot full of water from the local water supply, usually a mud hole filled with wallowing water buffalo. More progressive villages pipe this same supply to town fountains and thus mother doesn't have to mingle with the bathing buffalo. Meanwhile father, who may have spent an hour or two working in the rice paddy, snoozes away on his rattan bed or looks bored perched on a loose stone along the busy roadway connecting India and Tibet. Mother settles down finally to relax by nursing the youngest, aged from birth till as old as 5 years. Her peaceful songs are interrupted only by an occasional tubercular hack. The contrasts in this beautiful country can't be exaggerated. The valley becomes quiet, and the mighty eternal snows change from glistening white to red and purple in the setting sun. The only sounds to be heard are the yipping of a skinny, rabid dog or the squealing of a sick, parasite-infested hog. When the ragged silhouette of the mountains has disappeared into the darkness, it is time for the

marriage of the ghosts, traditionally taking place twice a week at Busheldara, the site of the United Mission Hospital.

Dr. Carl Friedericks very ambitiously undertook a difficult project when he came to Nepal in 1952 and chose Tansen as a site for the United Mission Hospital. Without mentioning makeshift operating rooms where spectators regularly cheered the removal of bladder stones and goats freely wandered among the sterile drapes (gratis a pressure cooker), the new hospital, half finished, is quite well done and will encompass 70 beds.

Out-patient medical service is much favored, since it is cheaper and less likely to ignite highly superstitious emotions. Consequently, with the exception of rounds and surgery, most of my day was spent seeing 40-70 male out-patients—the female out-patients, being very modest, were seen by a very fine Australian, Dr. Eleanor Knox, who whistled when there were interesting cases. In the clinic one noted that under the smiling faces of youth, the wrinkled and perhaps wizened face of the aged, there were severe and advanced medical problems—problems which came to us after as much as 40-80 miles of hiking over rugged mountains—people who waited to die by the sacred rivers holding the tail of a cow and looking forward to the next reincarnation. They finally came to us when death was too slow. The Brahmin and the coolie came together and were treated alike. Most wore filthy loin cloths covering filthier bodies. Many carried unwashed, malnourished babies, mostly boys, for the female is held in very low respect. Some would wear objects around their necks or in their ears to scare the spirits away.

One Brahmin priest arrived in acute distress from a village 16 miles away. He had had an indirect inguinal hernia which had strangulated 13 days before. On the tenth day before admission it had

become gangrenous and burst through his scrotum discharging feces and partly relieving the obstruction. Typically any large decision is debated, so for 3 days the family discussed whether to take him to the river to die or to the hospital. Since the sacred river was along the way to the hospital, they stopped for several days, but when he refused to die, he was brought in. By this time there was a gangrenous loop of gut hanging from a very livid, rancid scrotum full of pus. Conservative treatment followed by a surgical anastomosis was very successful.

Tropical medicine is very important here, for all the valleys below 2,000 feet have malaria and kala-azar. Also prevalent are parasites which include giardia ascaris, whipworm, hookworm, and especially the amoeba. One afternoon a coolie-farmer arrived from the Trari where he lived. This caste, Tharu, is apparently resistant to most tropical diseases. A large healthy looking boy, he complained of swelling of one ankle causing him to slow down a bit on the steeper trails. Besides malnutrition which is the usual cause of generalized body swelling, another frequent cause was filaria. Routine admission for a nocturnal peripheral smear revealed hookworm (hemoglobin, 6.8), a large spleen suggesting malaria or kala-azar, and a chronic cough. Tuberculosis was reluctantly ruled out.

Thus, one must agree that the human body is really a wonder. One man, for example, came to clinic complaining of a cough. We noticed a scar circling his upper arm. He said a snake had bitten him several weeks before, and it had been routinely treated by the natives by applying a tourniquet. After the eleventh day his arm was five times as big as normal, so he decided to take it off. Most arms slough off from dry gangrene leaving the stump of a bone, but the scar from the tourniquet was the only evidence a week later of the embarrassed circulation.

It is well known that hypertension is not a problem in the orient. For this reason I watched blood pressures, and it was indeed very rare for any to be higher or lower than 105/70. There were six patients who had a diagnosis of hypertension, and each was a Brahmin—a caste genetically linked with the same white stocks located in Europe. It is impossible to state the cause for such low pressures, but the conditions differing from the U.S. are the high mountains, much exercise, different races and diets, which include much rice. However, life certainly is not less stressful in Nepal, for it is a constant struggle to have enough food.

Customs of Nepal are interesting, such as the festival of menstruation held on August 25. It is a sin for a female to be touched during menstruation. So once a year there is atonement for this sin which begins by a day of fasting, then a day of dancing at the temple, followed by another day of fasting. The festival is well attended. Another custom is for women to be delivered by the sweeper, the untouchable, dirtiest of all the castes. After birth the woman is shoved into a remote corner on a pile of dirty rags for 5-12 days, during which time she is considered untouchable. Just as frequent a custom is the application of hot branding irons over areas of pain to drive out the evil spirits. Such patients come to the hospital now to have both the burn and the pain treated, but the branding continues just as religious practice decrees. Sacred cow dung is often stuffed into open wounds and in one remarkable case, was used to keep a young boy's brains from herniating through a gaping skull fracture. The fulminating meningitis was successfully treated, and, following surgery, the boy recovered completely.

On one of our village trips, we went north along the trade route to Tibet to visit a leprosarium at Malunga. Here

there are over 200 lepers living with their families and children in a government-sponsored colony providing room and rice, but no medications. So the mission hospital agreed to supply medicine and see them once a month. Their barrack-like houses were partitioned off into 15×15-foot spaces with 3-foot walls. At dinner time, when all the food was cooked over open fire pits, the room was blue with smoke. This resulted in a chronic bronchitis and conjunctivitis. The leprosy, which resulted in loss of feet, hands, noses, was a major problem almost eclipsed by the Urroose or bed-bugs. These were so thick that even the rats and mice had left. Interestingly, leprosy is not such a serious social disease, and only when there is a gross deformity is a person asked to leave. A medical permit allowed them to return. There was a large percentage of lepers coming to our clinic on the sly to be treated before their disease became too evident to their village. And the news that we had an effective treatment must have been generally known, for it was the only disease which could be readily treated on a long-term basis without great misunderstandings from the patient. The greatest tragedy was the presence of the children, for it is now presumed that only children contract the disease, which then has its greatest manifestation in early life. No case is known of an adult developing leprosy without exposure in youth.

That day along the trail we met a woman being carried to the hospital. She had been in urinary distress for several days, and it had suddenly become much worse. This exemplified the critical problem distance is for many of the acutely ill. Fortunately this woman made it. She was a primagravida whose retroverted uterus had failed to emerge from the true pelvis, thus blocking the urethra.

Though there is probably more food

per capita than in India, it is an unvaried diet of rice and dahl, a bean which supplies their main source of protein, and though vegetarian religious law prevails, some goat or buffalo meat is occasionally eaten. Any illnesses which might occur for the next year are always blamed on eating meat. Another protein source is buffalo milk which has a considerably higher butterfat content than cow's milk and so must be diluted before children use it. The worst cases of malnutrition occurred in the babies of mothers who were so completely suppressed by their husbands that thinking seemed to have ceased. Commonly they had run short of breast milk and hadn't managed to find any substitute.

Thus, the medical adventure this Smith, Kline and French Foreign Fellowship offered was fantastic. Never again could one think of any disease as a condition, for it involved the whole person, his family, his village. This certainly

emphasized that a person and his disease had to be observed in context with his culture and beliefs. And to do this, one had to ignore preconceived notions in order to see life as the patient did. In addition to the medical project, there was an excellent opportunity for short visits to eleven contrasting countries around the world. And though the visits were short, they weren't too short to make new friends and discuss new ideas and philosophies. Certainly the one thought which reigns supreme from this is that there may be varied religions, different ways and ideas of life which contrast strongly with our own; though one may speculate forever, if it matters, who is correct, one finds that everywhere there are genuine, helpful, friendly people who may enter one's life with an emotional impact never to be forgotten. My sincere thanks to Smith, Kline and French for making this unique adventure possible.

#### APPENDIX

##### LIST OF PRIMARY DIAGNOSIS FROM THE CLINIC AT TANSEN, NEPAL

1. abscesses	32. osteogenic sarcoma
2. amoebiasis	33. otitis media
3. arthritis	34. parotitis
4. ascaris	35. peptic ulcer
5. asthma	36. pertussis
6. bladderstone	37. pneumonia
7. bronchitis	38. prostatic hypertrophy
8. bronchiectasis	39. psoriasis
9. burns	40. pyelonephritis
10. conjunctivitis	41. rabies
11. cerebral palsy	42. tendonitis
12. cleft lip	43. thrombocytopenic purpura
14. dermatitis	44. trachoma
15. diabetes	45. traumatic conditions
16. emphysema	46. tropical eosinophilia
17. encephalitis	47. tumors
18. fractures	48. tuberculosis
19. gingivitis	pulmonary 8%
20. goiter	scrofula 2%
21. gonorrhea	Pott's Disease 1.5%
22. hepatitis	gastrointestinal 5.5%
24. hookworm	49. typhoid & panatyphoid fever
25. hydrocele	50. scabies
26. hypertension	51. syphilis
27. kwashiorkor	52. upper respiratory infection 8%
28. leprosy—9%	53. whipworm
29. malaria	
30. mumps	
31. neurosis	

Significantly increased percentages are included.

## On the Mathematical Literacy of Medical Students

CARL E. HOPKINS, Ph.D., M.P.H.,\* and VIRGINIA B. BERRY, B.S.†

University of California School of Public Health, Los Angeles 24, Calif.

While increasingly complex and sophisticated techniques of applied mathematics are becoming commonplace in the everyday work and writings of the medical and biological sciences, the instruction in mathematics and statistics being offered by medical schools or required for admission is generally minimal in amount and at a very elementary level (1), consisting mainly of a smattering of basic statistical principles and techniques presented on a "non-mathematical" level. This applies also to offerings for graduate students in biological sciences where these students are working in medical schools. This low level is attributed to the limitations of the medical student's premedical education, which usually includes only a minimum of "college mathematics," rarely any logic, modern algebra, calculus, or statistics. Yet there appears to be general agreement among educators and scientists that these are essential basic disciplines for the study of any science, including the biological sciences.

In 10 years of teaching statistical methods to undergraduate medical students and graduate students in biochemistry, physiology, anatomy, etc., we have been under constant pressure to degrade our offerings to meet the low levels of mathematical literacy and aptitude as-

sumed to be prevalent among our students. With ingenuity much simplification and demathematization can certainly be achieved without sacrificing validity and usefulness of an elementary or introductory course. However, this trend cannot continue indefinitely without raising question of the value of such offerings. Mathematics and statistics are not simple or easy subjects, and efforts to make them so reach rather early a point where the specificity of this powerful abstract language is so attenuated that nothing but vague "concepts" is left.

Desirous of avoiding such emasculating simplification beyond real necessity, and aware of how easy it is to get misleading impressions of a student group's level from a few extreme students, we determined to attempt direct measurement of the degree of mathematical literacy of our first-year medical students. The methods and results are reported herein.

First we examined the college records of the 80 members of the 1959 first-year medical school class for circumstantial evidence of their college preparation in the basic methodology of the sciences. Three indices, readily available, appeared to be pertinent: the number of credit hours in mathematics, the grade point average in science subjects, and the Medical College Aptitude Test (MCAT) score on the quantitative relations section.

The mathematics credit hours of our students ranged from 6 to 33 term (quarter) hours, with median at 15. These 15 hours are out of a median total

\* University of California School of Public Health, formerly Associate Professor of Public Health and Preventive Medicine, University of Oregon Medical School.

† Mathematics Department, University of British Columbia, formerly Research and Teaching Assistant, Department of Public Health and Preventive Medicine, University of Oregon Medical School.

TABLE 1  
TYPICAL TEST QUESTIONS

2.3 $(pr-n)/r =$	$(p-n)/r, p-n, p \cdot n/r$	(Fractions)
4.2 Round to 3 significant digits: 27992		(Significant digits)
5.2 What quantity of a 0.25 saline solution can be prepared from 400 cc. of a 10% solution?		(Measures and solutions)
6.2 Translate into a formula: the Atlanto-Dental Interval in the adult male is 2.052 mm. less 0.0192 mm. for each year of age.		(Algebraic symbols)
7.3 The following coded pairs of values were obtained for blood pressure and pulse rate in a dog work experiment. Plot the values on coordinate axes. BP: 4, 9,-3, 7,-1, 1,-6, 3,-4, 5,-1,-5 PR: 2, 1,-5, 0, 3,-3, 4,-2,-2,-1,-4, 1		(Directed numbers, graphs)
8.4 $(n-2)^n = 0$	T? F?	(Zero and one)
10.2 Given that $A = W^{0.426} \times H^{0.156} \times 71.84$ , write an expression for $W =$		(Solution of equations)
13.3 Find by interpolation the value for deposition of iron in the human fetus at 12 weeks and at 30 weeks, given the experimental values:  Age (weeks): 1 24 36 Mg. iron: 5 50 200		(Interpolation)
15.12 Write as 10 with an exponent: $(10^{0.1})^x$		(Exponents)
17.5 A committee of 2 men and 2 women is to be chosen from a list of 10 men and 5 women. In how many different ways can this be done?		(Permutations and combinations)
21.3 Various studies show that top students in medical school were also top students in college. This implies that if a student is top in college, and goes to medical school, he will be among the top in medical school. T? F?		(Logical reasoning)

of 92 hours (ranging from 68 to 165) in all science subjects. For the most part these hours represent the standard lower level college mathematics sequence, with a light scattering of such dubious topics as "business arithmetic."

The science grade point average (average grade in all "science" courses) of these students ranged from 2.30 to 3.76, with median at 3.10, representing a slightly improved B average.

The MCAT scores in quantitative relations ranged from 375 (10th percentile

nationwide) to 705 (98th percentile), with median at 525 (60th percentile).

Having thus determined that on the college record and the MCAT these students were high average, by national medical student standards, in their aptitude and college preparation for science studies, we essayed to test their working mathematical literacy directly. A test of mathematical know-how and reasoning ability was made up, consisting of 122 short items, distributed in 21 categories (see Table 1). The categories and most

TABLE 2  
SUMMARY OF SCORES ON BASIC MATHEMATICS TEST

Category	No. items	Mean no. of correct answers	Mean proportion correct (per cent)
1. Arithmetic	3	2.7	90
2. Fractions	3	2.9	98
3. Decimal points	7	6.8	97
4. Significant digits	10	4.6	47
5. Measures and solutions	4	1.3	32
6. Algebraic symbols	12	3.5	29
7. Directed numbers	3	1.8	58
8. Zero and one	10	8.9	89
9. Functions and graphs	7	2.7	38
10. Solution of equations	4	1.7	42
11. Inequalities	3	0.5	17
12. Ratios	3	1.0	34
13. Interpolation	5	1.4	28
14. Square root	4	2.9	73
15. Exponents and radicals	14	7.5	53
16. Logarithms	5	0.9	17
17. Permutations and combinations	7	1.4	20
18. Binomial expansion	2	1.4	67
19. Multinomial expansion	1	0.0	3
20. Quadratic equations	4	1.0	24
21. Logical reasoning	11	2.8	26
All:	122	56.5	46

Distribution of total scores (122 possible):

Median	53.5 correct
Lowest	17
Highest	86
S.D.	14.5

of the items were taken by random stratified (on categories) sampling from Walker: *Mathematics Essential for Elementary Statistics* (2), an exemplary text developed at Columbia Teachers' College for helping graduate students remedy the deficiencies of their college education. A few items were modified slightly and a few new ones added. Typical items are shown in Table 1.

At the beginning of our regular freshman statistics course the 80 students were given copies of this test and asked to take it home and do their best on it, without consulting references. They were told that the papers would be scored and returned to them, but no grades recorded, that it would help them diagnose their own strengths and weaknesses, and be

helpful in setting an appropriate level for the course work ahead. The students responded with evident interest in this opportunity to influence their instruction, and cooperated well, 69 out of the 80 turning in completed and usable tests. This is not, of course, a directly validated test, and so it is difficult to say what we should expect in performance on it. But the items are simple and straightforward, lacking in ambiguity. They have survived extended use by Walker and other statistics teachers. We felt, and believe most mathematics and statistics teachers would feel, that a rather high score would be required for successful performance on a graduate school course in elementary statistics. The results are given in Table 2.

From these results, even allowing for possible imperfections in test procedure, we conclude that on the average these students, and by implication medical students generally, though sufficiently apt and scholarly in quantitative relations, are not sufficiently equipped with basic mathematics to master an introductory course in statistical methods. With this deficiency standing in the way of mastery of the fundamental philosophy and techniques of science, we should think again when we talk about producing physicians who are "scientists as well as physicians."

#### ACKNOWLEDGMENTS

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## Teaching through Disasters\*

CARL E. TAYLOR, M.D.,† and MYRON E. WEGMAN, M.D.‡

Harvard School of Public Health, Boston, Massachusetts, and the Pan American Health Organization, Washington, D.C.

Disasters are part of life. When natural forces produce a "medical problem which exceeds the capability of the community"

(3), the mobilization of available resources is usually extemporized and unplanned. Medical students are often thrown into emergency volunteer service. After the whole episode is over, retrospective analysis often produces ideas as to how the experience might have been used for better teaching as well as for more effective use of the student's efforts. Fortunately, to be sure, disasters do not occur often enough in the experience of an individual teacher to enable him to benefit from previous experience.

A recent seminar series provided opportunity for fifteen teachers of preventive medicine and public health from eight countries to discuss the question of teaching through disasters. These teachers had participated in relief work in some 40 disasters (Table 1), with medical students having been mobilized in approximately half of these instances. From these discussions certain principles have been inductively derived which may help in developing flexible plans to make

emergency service in relief activities a fruitful method of teaching preventive medicine.

Advance planning is of basic importance. It is a fundamental dictum of planning for Civil Defense that the best way to meet an emergency is to prepare for it. Detailed consideration of medical preparation for disasters will not be attempted since this has been extensively reviewed (1-3). Part of this preparation should include provisions for using medical students where they are likely to be available, bearing in mind the potential of such service to the community, as well as its value as a learning experience for students and its limitations from both standpoints. The plan should define clearly the types of disaster in which students can help most effectively in order to offset the natural tendency in an emergency to emphasize the dramatic and ignore more fundamental and long-range values.

To provide a basis for a more detailed review of the suggested principles, brief abstracts of some case histories presented at the seminar follow:

### TYPES OF DISASTER

*Famine and typhus—Northern Vietnam, 1945.*—At the end of World War II during the interim between Japanese and French authority, transportation of rice from South Vietnam to the North was stopped. Through the winter and spring a major famine gripped the northern area, with three million estimated deaths. Starving people walked in from the villages to die on the streets of Hanoi. A

\* Seminar participants: Dr. P. Hrishikesh, Dr. B. K. Jerath, Dr. N. Lenh-Thieu, Dr. B. P. Malvea, Dr. S. N. Sotoodeh, Dr. Charn Satapanakul, Dr. G. Saroukhanian, Dr. L. Kant, Dr. G. Rodriguez-daSilva, Dr. M. C. Mittal, Dr. D. Pai, Dr. A. Segall, Dr. V. Prahlad, Dr. D. Selever, and Dr. D. Wilson.

† Department of Epidemiology, Harvard University.

‡ Present position: Dean, School of Public Health, University of Michigan, Ann Arbor, Michigan.

TABLE 1

## DISASTER RELIEF ACTIVITIES DISCUSSED IN SEMINAR FOR TEACHERS OF PREVENTIVE MEDICINE AT HARVARD SCHOOL OF PUBLIC HEALTH, MAY, 1959

Type of disaster	Number of instances	Country
Earthquakes	3	Iran
		India
		India
Floods	5	Iran
Major famines	2	India
		Vietnam
Major fires	2	India
Hurricane	1	U.S.A.
Riots and refugees	5	India
		Vietnam
Snow avalanche	1	Switzerland
Wild animals causing panic	2	India
Train accident	1	India
Mine cave-in	1	India
Cholera epidemic	4	India
Smallpox epidemic	6	Thailand
		India
Epidemic typhus	1	Vietnam
Typhoid epidemic	2	India
Malaria epidemic	1	Iran
Plague epidemic	2	India

group of medical students organized a voluntary relief committee and collected thousands of victims into camps where they were fed by charity groups. They published a small news sheet which was distributed throughout the country to procure donations of food. The students worked so hard and became so depressed that many themselves became sick. They developed psychological blocks to proper eating. Among one group of twenty there were three who developed bleeding peptic ulcers. As the famine started to wane, a severe typhus epidemic started, and all students were given major responsibility for direct medical relief.

*Earthquake—Bihar, India, 1934.*—A large part of a heavily populated province was involved in a series of severe earthquakes. Out of a population of 25 million, an estimated 30,000 died. Thousands more were injured. To provide medical

relief all resources were mobilized. Medical schools were closed, and students organized into teams under the general supervision of doctors from the health services. The students worked on their own in groups of two or more. Following a preliminary period of active rescue work and emergency first aid, the student teams were used in epidemic control activities. They medicated wells and distributed large quantities of a few basic medicines. During the cold winter that followed there was much illness but no major epidemics. Student response was variable, but generally cooperative during the period of greatest emergency. The government paid for living expenses.

*Flood and cholera epidemic—Godavari River in Andhra Pradesh, India, 1953.*—Villages and towns in an area with 2½ million population were flooded. Cholera is endemic in this area, and as the flood receded a severe epidemic spread from village to village. All available resources from Madras were thrown into relief work. Colleges were closed, including medical colleges. Students were divided into teams with a medical student as leader and two college students as assistants. They were assigned groups of villages and went about in boats of fishermen to chlorinate wells, inoculate with cholera vaccine, and give first-aid treatment and anti-malaria pills. The students had to make their own way, arranging for boats, for places to sleep in the villages, and for food from emergency relief supplies and from the people. The difficult living conditions discouraged many, but the needs of the people were so evident that most students willingly participated. Students appreciated the small allowances provided by the Red Cross for their maintenance expenses.

*Flood—Sutlej and Ravi Rivers, Punjab, India, 1955.*—In 3 days at the end of the monsoon over 50 inches of rain completely submerged several thousand

villages. One medical college assumed responsibility for relief in an area including 300 villages with about 300,000 people. Most of the students participated in activities which were phased as follows:

- a) Operation Rescue: teams of students rescued villagers by raft from trees where they had spent as many as 3 days with no food, with babies being born and snakes also taking refuge from the water.
- b) Operation Chlorination: As the water went down, all wells were chlorinated in a period of 3 days.
- c) Operation Medication: Teams of students supervised by staff physicians camped in villages for periods of several weeks to provide medical relief and first-aid treatment.
- d) Operation Rehabilitation: As the rebuilding of villages started, advantage was taken of the destruction to give advice about improved housing and sanitation.

The enthusiasm of students was great as long as appropriate leadership was provided. When leadership by staff leaders of teams failed, students took over. Perhaps the greatest problem leaders had was to restrain students from taking unnecessary risks in their eagerness to serve. No question of remuneration arose, but food and tents were provided.

*Smallpox epidemic—Andhra, India, 1957.*—An outbreak of smallpox in a group of three villages led to many deaths, but the number was not known because of fear of the Hindu goddess "Mata Devi." It is believed that the disease occurs when she comes to visit, and any interference only makes her more active. The local health services were attempting to conduct an active vaccination campaign. It was decided to take the students to the villages to survey for the extent of spread and to

observe local epidemiology. Strong objections were raised by some faculty members because of the hazard of exposing students to infection even though they were vaccinated. The exercise was made voluntary, and all but a small fraction of the preventive and social medicine class spent a useful day visiting homes in the villages.

*Cholera epidemic—Bihar, India, 1944.*—A severe epidemic of cholera followed a flood in the Kosi River Valley, with no means of estimating the extent of spread in the villages. Medical students from two medical colleges were recruited by the government health services to give cholera vaccinations and to medicate water supplies. They were paid fairly liberally and were expected to make their own living, food, and transportation arrangements. The whole program had to be called off because of complaints from village people that the students were not working and were imposing on local girls.

*Typhoid epidemic—Teheran, Iran, 1949.*—A severe epidemic of typhoid in villages near Teheran led to the decision to attempt mass vaccinations. Students were released from their routine activities if they volunteered to join vaccination teams. Living expenses were provided. An almost festive atmosphere prevailed, with students volunteering mainly to have a good time.

*Cholera epidemic—Thailand, 1958.*—Starting in the suburbs of Bangkok a severe epidemic of cholera spread throughout the city and then to other towns and villages. The opening of the two medical schools in June was delayed so students could be used for emergency services. They were given a period of special training in the cholera wards of the University Hospitals and then sent to the rural areas. Each team consisted of a senior house officer, a junior house officer, two male nurses, and six junior

and senior medical students. They established emergency health and hospital units and worked with public health officers in chlorinating water supplies and mass vaccination. They undertook health education by visiting schools, giving talks from motor boats equipped with loudspeakers, putting up posters, and attempting to raise special charity funds. The emergency lasted more than a month during which the students worked with a high degree of efficiency and dedication.

#### BASIC PRINCIPLES

For convenience the principal lessons learned from this analysis have been itemized under "Values" and "Limitations." Consideration of both should be undertaken before sending medical students into a disaster situation.

##### Values

###### *To the student.—*

1. Service motivation is developed in disaster situations because the physician's role in meeting human suffering is dramatized. Lasting impressions are created which will encourage idealistic attitudes in more routine activities.
2. The teaching value of disaster services can be great because much work is concentrated into a short period. This applies particularly to preventive medicine.
3. Of particular value is the opportunity for students to learn to distinguish between activities which are essential to effective practice and those which are merely ritualistic. If properly guided, they learn that in emergencies some corners can be cut with relatively little loss while basic safeguards must be carefully maintained.
4. Ability to assume responsibility in emergencies is required of any doctor in his daily practice. Disaster relief provides opportunities to gain such experience under supervision.
5. The teaching value of natural dis-

asters can prepare doctors for eventualities which may be faced in event of war.

###### *To the community.—*

1. A group of intelligent, young, active persons with basic knowledge of science and principles of medicine may complement overly strained and often already inadequate medical services.

2. By spreading the base of participation, more education of the community is possible on what has actually occurred and what can be expected from the disaster, thus helping to counteract the inevitable spread of rumor and misinformation.

##### Limitations

1. Every disaster situation presents a personal hazard to students not only in the form of exposure to physical injury or epidemic disease, but also as regards the psychological trauma of throwing relatively immature students into some of life's most harrowing experiences.

2. Even when there is no overt psychological trauma discouragement of students is to be expected when they are faced with overwhelming need. It is, therefore, important to direct students' attention to the positive contributions being made rather than letting them be frustrated by the large volume of unmet need.

3. In their enthusiasm students tend to take chances beyond the normal limits of safety.

4. Oftentimes relief operations appear on the scene after the major crisis has passed. There may then be more help than is necessary. If students are not kept busy, disillusionment will neutralize any value from the experience and the emergency experience will not compensate for the loss of regular scholastic activities.

5. Too much may be expected by laymen unaware of the limited state of the students' knowledge and experience. They may be required to carry out procedures

beyond their abilities, which may lead either to overconfidence or frustration, and, conversely, failures may provoke unwarranted community disillusionment with the role of the medical students.

6. There may be temptation for the students to become so much a part of the medical care picture that there is pressure to keep them on too long, to the detriment of their regular studies.

#### SUGGESTIONS FOR PLANNING

A flexible plan of approach should be developed by medical administrators and teachers. If a disaster does appear where students can be used, prompt action is necessary, but it should be directed according to plans which provide clear definition of responsibilities.

1. Supervision: For effective teaching it is essential that medical students have even more supervision than is necessary in other practical work. Students should not be left on their own, since the insecurity of being thrown into emergencies greater than they can handle will have a deleterious effect on their maturation.

2. Responsibility: As in any form of practical teaching students should work, not observe. In an emergency no one has time for people who are just looking on. The plan should assign specific duties which students can properly carry out themselves.

3. Preparatory instruction: Although most emergencies provide little time for formal teaching, detailed briefing sessions are essential for efficient operation. If possible, written instructions should be circulated covering expected situations in the particular disaster.

4. Protection of the students must be a primary concern of those supervising the experiences. Especially to be recognized is the tendency of students to undertake impetuous and sometimes too daring ventures in emergencies. Where

epidemic disasters are present, preventive measures must be strictly enforced.

5. Voluntary service is, in general, more desirable than paying for work done. All living and personal expenses incurred, however, should be the responsibility of the government or a voluntary organization.

6. Disaster service should be optional. If students are under pressure to serve, they will be ineffective in the field and learning value will be minimal.

7. The role of students needs to be clearly defined. If they are to function as doctors, it should be with appropriate safeguards. Unless their obligations are clear both to themselves and to others, they will be asked to do things beyond their capabilities or will not be given enough to challenge them.

#### SUMMARY

Analysis of experiences with civil disasters in various countries of the world leads to the conclusion that with proper advance planning it may be beneficial to the education of medical students to participate in relief efforts. In the advance plan it is important to include appropriate safeguards for both students and the community.

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## Patient Reaction to the Teaching and Research Situation\*

JULIUS B. RICHMOND, M.D.†

State University of New York Upstate Medical Center, Syracuse, New York

I am delighted at the opportunity to discuss with a captive group of University Hospital administrators the matter of patient reactions to the teaching and research situation. My delight is borne not out of hostile impulses for administrators (I say this since I assume that almost all professionals feel that they have at some time or another suffered undue frustration at the hands of administrators), but rather because of the opportunity to discuss—as collaborating professionals—a problem with which we are equally concerned. In short, I do not feel that the faculty or the administrative officers in a University Hospital have an exclusive or proprietary interest in the patient and his care. Rather, since the service to patients is the central focus about which teaching and research centers, it becomes important that we work toward the provision of the highest quality service, administered in the most sensitive way possible.

Since much has already been said about the quality of patient care and its evaluation in teaching hospitals, I will not dwell on this aspect of the subject. The central problem of this discussion is epitomized in the first paragraph of the article "The Decline of the Healing Art," by Selig Greenberg, which appears in the October 1960 issue of *Harper's*. He states, "In the

loneliness and terror of illness, we become helpless and childishly dependent. Above all, we need love. But this today's physician seldom has time or inclination to give. The patient's sense of unrequited love reflects a major failure of modern medicine which is an even more widespread source of discontent than its high cost. The hasty, superficial, and impersonal treatment rendered by overworked doctors is the commonest complaint in current opinion samplings." Although Greenberg speaks of the healing art generally, his point is entirely applicable to the teaching and research situation. The challenge is before us. Systematic studies of patient reactions to the teaching and research situation have been few and have been mainly limited to psychiatric hospitals. We therefore must rely predominantly on our convictions for action.

At the outset, I would like to emphasize a guiding principle I have always held before me: that is, that administration should serve program. I know that this may be platitudinous to mention in a meeting of hospital administrators, for indeed this is probably the basic principle taught in "Hospital Administration" at any school for hospital administrators. It may, however, bear repeating by an individual who has had no formal preparation in this field. I feel that administrators cannot serve program effectively if their concern and professional background are exclusively related to administrative problems and not to

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† Chairman, Department of Pediatrics.

the content of the program. It becomes important, therefore, that administrators have a wholesome awareness of the problems of patients and their individual needs—what we might designate as the psychology of patient care.

It might be appropriate to present a brief historical overview of clinical teaching in the early decades of this century. When clinical teaching centered largely about description, there was considerable emphasis on having the student see a large number of patients; since we were in an era of descriptive medicine and the medical school program constituted the terminal educational experience for the student, it was appropriate to attempt to have the student "see everything." The utilization of our large public hospitals as the major centers for teaching (although they were not planned for teaching) facilitated this tendency. Thus, two purposes were served: first, there was provided a large volume of medical care; and, second, students were given an opportunity to see vast numbers of patients whom they could categorize descriptively.

I mention this period in medical education because I believe it left us with some residue with which we have not yet adequately dealt. In the milieu of the large public hospital young students caring for vast numbers of patients had to develop some capacity for self-protection from the many—and often intense—social problems which patients brought with them. A major protective device was insulation from the personal problems of the patient by immersion in the biological problems. To inquire into all these problems would have been much too great a load for most young students to deal with. I mention this not in any critical fashion, but rather to understand the problems which students in that era faced as well as to indicate that the issues we face in providing sensitive patient care today are not new. As we

look toward progress, we have no reason to long for the "good old days." From my personal experience as a house officer, I would wonder whether students could have survived had they not developed this kind of defensive armour of insensitivity, at least at the superficial level. Indeed, in retrospect, much of the house staff jocularity which was observed under such circumstances was part of the defensive maneuver—the effort to deny the tribulations under which the house staff worked. Again, I wish to emphasize that I am not being judgmental; rather I am attempting to define some of the dynamics of the learning process.

We have now emerged into an era of dynamic biology in medicine in which the emphasis is on an understanding of process rather than on description and categorization. The result has been that we no longer rely on large numbers of patients for effective clinical teaching. Rather, the advances in biochemistry, microbiology, physiology, pharmacology, and investigative techniques have complicated the study of patients and rendered it impossible for a student to care for many patients.

With the development of a more dynamic biology has also come a greater awareness of psychological aspects of patient care—the influence of the psychology of the patient on his physical illness, and vice versa. In this connection I believe it is important to note that we are talking about aspects of patient care which it is commonly said the "old family doctor" cared for so capably. Without attempting to detract from the "old family doctor" I believe it is necessary to indicate that our emphasis is now on teaching the *young* doctor to have the same degree of wisdom and facility in caring for the psychological needs of patients which the old family practitioner had. It is interesting to note that, when people talk about the old family doctor,

there is emphasis on the word *old*. We are now trying to teach students to have the same compassion and skill in the management of their patients which the practitioner of yesteryear spent decades developing. Our modern knowledge of psychology, sociology, cultural anthropology, and psychiatry should enable us to accomplish this objective somewhat earlier.

The rapid changes in the sociology and economics of medical care are also pressing us—and I believe very desirably so—to consider the patient's psychological needs more comprehensively. The development of insurance programs of various kinds, including governmental programs such as state aid for handicapped children and medical care for the aged, potentially provide the patient with greater choice in selecting his medical care. Certainly if the teaching hospital does not satisfy the patient and his family, it is altogether likely that the patient will go elsewhere. The emergence of many effective private group practices makes it perfectly possible for patients to receive even complex diagnostic and therapeutic care in a nonuniversity hospital setting. Indeed, the large private clinics have developed skills in dealing with patient's personal needs to an extent that many of our university hospitals would do well to emulate.

In a discussion of patient reactions to the teaching hospital, it becomes necessary to try to define the patient's problems as he enters the teaching setting. In the setting of the vast physical structure of the modern out-patient department and hospital, the patient often enters with some degree of depression, anxiety concerning separation, and certainly considerable preoccupation with himself. It is small wonder that he is considerably confused by the complexity of the physical plant and the multiplicity of people circulating about with varying

degrees of authority and officiousness. At the extremes of life—the very young and the elderly—the confusion and loneliness are accentuated. We should also remember that specific psychological difficulties may be precipitating factors in bringing a patient to the hospital even when his illness seems primarily physical. This problem has been the object of study by Drs. Schmale and Engel at Rochester over the past several years. Their studies indicate that a significant number of patients admitted to a general medical service have undergone a significant separating experience or threat of separation within one week prior to admission.

Although we could become quite psychologic in discussing our efforts to meet the patient's needs, I am electing to deal with this problem in operational terms. In other words, our concern is with the practical aspects of programming which will provide most adequately and comfortably for the patient. Perhaps the basic need of the patient is for respect. If the patient is not treated with respect, it becomes difficult for him to have self-respect. Without self-respect, it may be difficult for him to muster his resources in a way which will enable him to deal with both his biological and his environmental problems. Conversely, however, we have seen many effects which I would consider to be distinctly positive under more optimal conditions—effects which I often refer to as psychotherapeutic effects in a non-psychotherapeutic setting. In our pediatric out-patient and in-patient departments, we have seen families headed down the road toward social disorganization and disintegration gradually reverse their direction toward better integration both within the family and within the community—not because of formal psychotherapeutic efforts, but rather based on a relationship of mutual respect. Out of such a relationship comes status and dignity.

How can we communicate our respect for the patients who come under our care in operational rather than psychodynamic terms? In effect what I am suggesting is a check-list around which we can examine our services, because respect is born out of the "little things" which make the "big difference." For years I have intuitively made evaluations of the sensitivity of patient care as I visited other services. The following are some of the common denominators which seem of considerable significance to me.

1. Respect for identity. One of the basic building blocks in any program of patient care should be an opportunity to relate primarily to one person on the staff. In these days of revolution in biochemical genetics we teach one gene—one enzyme; it might be well for us to coin an analogous aphorism: one patient—one doctor. The private clinics have tended to be quite effective in this direction. Our large teaching hospitals, however, can be similarly effective. We have found it desirable, for example, to have every child admitted to the pediatric clinic as his "home" clinic. Thus, no matter where the patient and parents go, there is a central figure who will provide interpretation and serve to reduce anxiety about uncertainty which is associated with new consultations and procedures. This is more work for us to be sure, but there is no alternative, we feel, in providing high-quality services. This function, unfortunately, cannot be delegated to a nonmedical person, since the gathering of all of the data and its interpretation necessarily require a medical background. Also, the history which we obtain is richer and more meaningful if there is a relationship with one physician. Over a period of time confidence develops which permits the elicitation of more data than occurs on an equal number of visits to a variety of physicians. Even though we necessarily rely heavily on

house staff for patient's contact, it is possible to build in *continuity of care* if we are alert to its significance. As house officers change, provision can be made for the transfer of patients to facilitate continuity. Staff physicians can often serve in a bridging fashion to provide the continuity without necessarily taking over the care of patients. We have not been sufficiently imaginative in our programming to resolve this problem adequately.

In visiting a hospital one can get a feeling very early concerning the sensitivity of patient care by noting how patients are addressed. Is Mr. Smith referred to rather anonymously as "Dad" or room number 402, or is he Mr. Smith regardless of his social and economic status? Does the child have a name by which he is addressed, or is he referred to as "the case of leukemia"? Do we know his nickname and eating and toileting habits? Little things, we might say, but the substance out of which relationships and the feelings about relationships and a sense of identity are conveyed.

Another aspect of respect for the individual may be manifested by the matter of visiting hours. Are visiting hours conducted in relationship to the patient's needs, or do they reflect some circumscribed schedule that the nurses have conjured up, or is it a schedule which has been in existence for decades without anyone's ever having taken the trouble to reexamine it? We have found that in many instances nurses have had misconceptions about the desirability of a family's stay in the hospital. On our pediatric service, for example, when we were doing a study of the effects of folic acid antagonists on acute leukemia, we asked the parents to stay with the more critically ill children as freely as they would like. At first the nurses were highly resistant to this; but after a period of months, they found that the presence of the parents made it con-

siderably easier to deal with the children and that the parents were helpful in many instances—not alone in the care of their own children, but in the care of other children on the service.

2. Respect for privacy. Again, regardless of economic status each individual has some need for privacy. Are the interviews conducted in an area where there is an opportunity to talk without being overheard? Many of our hospital wards do not have adequate provisions for this degree of privacy. In relationship to physical examinations, is there appropriate provision for privacy? I believe we could do well, too, to re-examine our need to have multiple individuals examining and re-examining patients. Again it is necessary to point out that the student will not see everything which he is to see in his lifetime during his student years. Certainly he has, in most instances, 3-4 years of house officer training before him, and there would appear to be little reason to subject patients to an inordinate number of examinations.

The matter of ward rounds and conferences at the bedside is another indication of the respect for the individual. Again we need to examine our time-honored practices. The matter of the entourage of the chief and all of the house staff and students trailing behind as a teaching exercise could well be questioned. Now that we have tended to introduce classrooms on our wards, I see little purpose which is served by parading up and down the wards. It seems to me that most of the pertinent issues concerning patients can be discussed in the classroom more comfortably and with a blackboard available and either the patient brought to the group or the group in turn making a rather brief visit to the bedside. The prolonged conversations at the bedside, I believe, are almost without merit—and in many instances actually traumatic as an invasion of privacy—for the

patient, and certainly are not very informative for students. Again is this not a carry-over from the days when teaching took place in what were essentially nonteaching hospitals?

3. Respect for time. This perhaps is one of the more subtle aspects of conveying to the patient that we have some degree of respect for him. This is a particular problem in the out-patient department and in admitting procedures for the in-patient service. One screening test is to define the length of time between arrival at the admitting office and the patient's being situated comfortably in bed. I daresay that in most teaching hospitals this is still a very considerable period of time. On a service with which I was affiliated we reduced this time by 3 hours at one point, simply by paying some attention to details and removing some of the thoughtless roadblocks. Since the patient arriving at the hospital is often preoccupied, somewhat depressed, and anxious about separation, prolonged waiting only increases his anxiety.

In the out-patient department, particularly, students often will take inordinate lengths of time to obtain a history. The assumption is made that, particularly for patients of low socio-economic status, their time is worth nothing and is available only to the student. Not too long ago I encountered a situation in which a student had taken 2½ hours to elicit a history and was rather perturbed that the mother of the child felt that she had to terminate the session in order to get home. He had no awareness of the fact that her school-age child was due home from school and no one would be there to meet him or to prepare his lunch if she were not home. One would also raise the question as to whether any interview is productive after a period of an hour.

Another aspect of respect for the patient's time relates to the matter of appointment systems. One can get a good

feel of the sensitivity of a program of patient care by noting whether there is an appointment system in an out-patient clinic or whether the patients are all instructed to come early in the morning and early in the afternoon and then wait their turn at the convenience of the doctor.

Out of these relationships the patient has the potentiality for developing confidence in the institution. However, we should emphasize that the patient's confidence is not in relation to the mortar and bricks of the institution, but rather to people within it.

All the problems I have mentioned up to now can be dealt with most effectively in the teaching situation by example. It seems to me that, if the faculty members are sensitive to patients' needs, the student will soon identify this sensitivity and respond to it. Certainly he will recognize the respect and empathy which the physicians on the faculty have for their patients.

This raises a central question, therefore, concerning the matter of dealing with patient reactions to the teaching hospital. The central question relates to the sensitivity of the teaching faculty in dealing with these issues. It seems to me that, in recruiting faculty for clinical teaching, this should be a very basic aspect of the evaluation of the competence of the individual. I am not suggesting that investigative skills are unimportant; but if a person is to be a *clinical* investigator, it seems to me that he must have some capacity to empathize with the patient. If he does not, he might more appropriately remain an investigator in the basic sciences.

I would in this connection like to put to rest what I believe to be a myth in relationship to clinical teachers—that the private practitioner has greater capacities than the full-time teacher. In my opinion, this has little to do with the

method of practice. It has to do with the individual's orientation toward the people for whom he cares. I have seen insensitivity in practicing physicians in the same way that I have seen insensitivity in full-time clinical teachers. I should, however, mention that on some occasions the practitioner group is less responsive to patients of lower socio-economic background than our full-time faculty members. Many of our private practitioners practice in a relatively narrow stratum of the population and have less awareness of the needs of people in other social groups than may some of the full-time faculty. I am *not* suggesting, however, that either one of these groups has a monopoly on empathy for patients.

I do wish to leave the emphasis that respect for human beings who come to us for medical care is something which to a considerable extent can be taught. If I had no confidence in this, I would tend to place my reliance exclusively in the selection process for medical school admissions. Since we cannot, however, rely on any kind of selection procedure to provide us with human beings as medical students who will have all the potentialities for providing sensitive patient care, we must have confidence that this approach can be taught. I believe it is possible for a young student to acquire over a period of years some respect for the needs of individuals largely through the process of emulating the senior members of the profession who are charged with teaching him. What the student often needs is the sanction to be curious and friendly. This is the challenge for faculty members in the teaching hospital; the challenge to hospital administrators is to facilitate programs which make possible the provision of sensitive patient care which should characterize the teaching hospital—even in the face of its complexity.

## Intellectual Factors and Academic Performance in Medical Undergraduates\*

A. E. SCHWARTZMAN, Ph.D.,† R. C. A. HUNTER, M.D.,‡ and  
R. H. PRINCE, M.D.§

Department of Psychiatry, Faculty of Medicine,  
McGill University, Montreal, Canada

This paper will describe some preliminary efforts to determine the relative importance of intelligence and scholastic aptitude in medical school performance. The study reported here is part of a larger investigation concerned with the identification and assessment of factors affecting the academic attainment of medical students at McGill University. Previous work has indicated that the correlation between tests of intelligence and achievement grades in medical school is relatively low (2, 4-6). It has been pointed out that this finding can be expected, since procedures employed in the selection of students for medical schools tend to eliminate the less able applicants (1,3).

In September of 1959, a counseling service was made available to McGill medical undergraduates. Students encountering difficulty either were referred by the Dean of the Medical Faculty or came on their own to discuss their problems. During the 1959-1960 semester, some 45 individuals made use of this facility. The types of difficulty presented by these students were varied, ranging from specific concerns with school work

to fairly serious emotional and personality difficulties.<sup>1</sup> The purpose of the present study was twofold. Firstly, we wished to determine whether students who required counseling were distinguishable in intelligence, scholastic aptitude, and academic rank from a control sample of their classmates who were judged adequate both in their school work and in their personal adjustment. Secondly, we wished to establish whether relations among the variables of intelligence, aptitude, and academic rank in the counseled group were different from those obtained in the control sample of McGill medical undergraduates.

### METHOD

The 45 students who comprised the counseled group were compared with a sample of 34 control subjects. The students of the latter group were chosen from a larger sample of undergraduates randomly selected from all 4 years of medicine. Those individuals were excluded who had a history of psychiatric treatment, or who had failed one or more courses during their premedical or medical school careers. The two groups were similar in age, sex distribution, and national origin. (McGill University draws

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† Research Associate.

‡ Lecturer.

§ Lecturer.

<sup>1</sup> Two papers which deal with this aspect are in preparation. They are entitled, "Comments on Emotional Disturbance in a Medical Undergraduate Population," and "Specific Inhibitions of Learning in Medical Students."

TABLE 1  
MEAN SCORES ON WAIS AND FIRST-YEAR RANK

TEST		GROUP	
		Control (N=34)	Counseled (N=28)
Full Scale I.Q.	Mean:	126.4	124.8
	SD:	6.0	7.1
Verbal Scale I.Q.	Mean:	128.2	126.0
	SD:	7.4	10.3
Performance Scale I.Q.	Mean:	120.3	119.8
	SD:	8.5	9.9
Verbal I.Q. minus Performance I.Q.	Mean:	7.9	6.2
	SD:	10.6	14.1
Verbal-Performance Spread	Mean:	10.3	11.6
	SD:	8.4	9.9
Academic rank	Mean:	29.0* (N=31)	54.7* (N=38)
	SD:	23.5	33.4

\* Difference between groups in mean academic rank significant beyond .01 level of confidence.

MEAN SCORES ON MCAT

TEST		GROUP	
		Control (N=32)	Counseled (N=40)
MCAT Average	Mean:	547.5	526.3
	SD:	65.5	55.5
MCAT Verbal	Mean:	557.8	550.3
	SD:	102.6	81.2
MCAT Quantitative	Mean:	551.9	540.0
	SD:	71.5	63.9
MCAT Mod. Society	Mean:	526.9	508.3
	SD:	89.6	71.9
MCAT Science	Mean:	553.1	505.3
	SD:	77.9	89.1
MCAT Spread	Mean:	168.9	176.1
	SD:	98.1	64.3

students from many countries, and, therefore, it becomes necessary to account for this factor.)

Three measures were used in making comparisons between these groups. The Medical College Admissions Test (MCAT), which a large majority of the medical undergraduates had written prior to their admission to the McGill Faculty of Medicine, was used as a measure of scholastic aptitude. The four subtests on this scale, namely, the Verbal, Quantitative, Knowledge of Modern Society, and Science, were employed as estimates of specific aptitude. In addition, the mean of these four sub-test ratings served as a composite measure of general aptitude. The student's academic rank at

the end of his freshman year was treated as a measure of his academic performance. Twenty-eight students of the counseled group and all 34 control subjects were individually tested on the Wechsler-Bellevue Adult Intelligence Scale (WAIS). The scores obtained were employed as a measure of intelligence. The size of the samples used in the statistical analysis of data varied because a small number of students either had not written the MCAT or had taken their freshman year at another medical school.

#### RESULTS

The counseled and control groups were compared on the WAIS and MCAT, and on their academic standing. Table 1 pre-

TABLE 2  
PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS ( $r$ ) BETWEEN WAIS AND MCAT

TESTS		GROUP		
WAIS	TESTS	MCAT	Control (N = 32)	Counseled (N = 26)
Full I.Q.:	vs.	Average MCAT	.42*	.69†
	vs.	Verbal MCAT	.34‡	.59§
	vs.	Quant. MCAT	.53§	.48*
	vs.	M/S MCAT	.20	.42‡
	vs.	Science MCAT	.26	.42‡
Verbal I.Q.:	vs.	Average MCAT	.70†	.58†
	vs.	Verbal MCAT	.72†	.44‡
	vs.	Quant. MCAT	.45§	.25
	vs.	M/S MCAT	.58§	.20
	vs.	Science MCAT	.33	.61†
Performance I.Q.:	vs.	Average MCAT	-.11	.43‡
	vs.	Verbal MCAT	-.23	.35
	vs.	Quant. MCAT	.29	.48*
	vs.	M/S MCAT	-.30	.46‡
	vs.	Science MCAT	-.01	-.02
Verbal I.Q.	vs.	Performance I.Q.	.09	.08

\* Significant at .02 level of confidence.

† Significant at .001 level of confidence.

‡ Significant at .05 level of confidence.

§ Significant at .01 level of confidence.

sents the means and their respective standard deviations on these measures for each group. No significant differences appear between the two samples on the WAIS and MCAT. Since MCAT scores are scaled in units of 10, the numerical difference between the groups on this measure are not as large as they would appear. The counseled subjects tend to be both duller and brighter than the control students. On the other hand, they appear more uniform than the control students in their MCAT scores. The differences between the groups in these two respects, however, are not significant. The groups are also similar with regard to the spread between Verbal and Performance I.Q. scores and with regard to the spread of the four MCAT sub-test scores. The two samples do differ significantly, however, when their mean academic ranks are compared. The control subjects, on the whole, are superior to the counseled group in their academic rank standing at the end of the freshman year. They obtain a mean rank of 29.0 as compared

with the counseled group's mean rank of 54.7. In addition, they are more uniform as a group in their academic performance.

Pearson Product-Moment correlation coefficients were calculated to determine the relation between WAIS and MCAT scores in the two groups. Table 2 summarizes these data. A positive relation exists in both groups between Full-Scale I.Q. and the MCAT scores. Both groups also demonstrate a positive relation between the WAIS Verbal Scale I.Q. and the MCAT scores. The groups are significantly dissimilar, however, when the correlations between the WAIS Performance I.Q. and MCAT scores of each group are compared. In the counseled sample, a positive relation, except for that between Performance I.Q. and MCAT Science, is indicated. In the control group, a generally negative trend is seen, except for that between Performance I.Q. and MCAT Quantitative. In both samples, there was no relation found between Verbal and Performance I.Q.'s.

TABLE 3  
PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS ( $r$ ) BETWEEN FIRST-YEAR RANK AND WAIS AND BETWEEN FIRST-YEAR RANK AND MCAT

		GROUP			
		Control $r$	(N)	Counseled $r$	(N)
Rank vs:	Full Scale I.Q.	-.06	(31)	-.36	(26)
	Verbal Scale I.Q.	-.17		-.43*	
	Performance Scale I.Q.	.03		-.30	
Rank vs:	MCAT Average Score	-.04	(29)	-.34*	(38)
	Verbal MCAT	-.05		-.26	
	Quant. MCAT	-.10		-.17	
	M/S MCAT	-.03		-.12	
	Science MCAT	.01		-.37*	

\* Significant at .05 level of confidence.

Pearson Product-Moment correlation coefficients were also calculated to determine the relation between academic rank in the freshman year and WAIS I.Q., and between academic rank and MCAT score. Table 3 presents the correlations for the two groups. It should be pointed out that a numerically low academic rank score signifies superior academic performance. Thus, a negative correlation between the WAIS or MCAT and rank would indicate that high-scoring students on the WAIS or MCAT attain low rank scores, i.e., superior academic standing. In the counseled group, WAIS Verbal Scale I.Q. and academic rank are negatively related. There is also a significant negative relation between the MCAT average score and academic rank and between MCAT Science and rank. A strong negative trend is indicated in the relation between Full-Scale I.Q. and academic rank. In general, then, those counseled medical students with relatively high Full-Scale I.Q.'s, Verbal I.Q.'s, MCAT average and Science Scores tend to do well in their freshman year. The control group does not present this picture. No significant association is revealed between academic rank and WAIS I.Q. nor between academic rank and MCAT scores. Although the counseled group's correlations between the WAIS and rank, and between MCAT and rank,

are not reliably higher than those of the control sample, there is a sufficiently consistent pattern in these results to suggest a real difference between the groups in these respects.

The relations among the measures of intelligence, aptitude, and academic standing in the counseled group were further analyzed. Those students of the counseled group whose problems centered primarily on their academic performance in medical school were compared with those who sought help for other reasons. Because the number of individuals in these sub-groups is small, generalizations at this stage of the investigation are not warranted. Only the more noteworthy trends will be reported here. When the two sub-groups were compared on the WAIS Full-Scale I.Q., a significant difference emerged. The students whose complaints were "non-academic" obtained a mean I.Q. of 127.5. Those with concerns about their school work obtained a mean I.Q. of 122.0. However, there was no significant difference between these samples on the MCAT. In the group having scholastic problems, students referred by the dean because of failing academic performance were compared with those who came on their own to discuss their school work. The latter students did not differ significantly from the control group in Full Scale I.Q. (124.7

mean). Students referred because of failing work obtained significantly lower I.Q.'s (118.4 mean).

#### DISCUSSION

The results indicate that the students who required counseling were, on the whole, no different from their more successful classmates in their intelligence test scores and aptitude ratings. Since the control subjects were chosen because of their passing academic performance, it was, of course, expected that these students would be a better-achieving group than the counseled sample. The extent of their scholastic success, however, was not anticipated. At least two-thirds of this group attained grades which placed them in the upper half of their freshman class. Such students appear to comprise a rather select group, whose achievement goes beyond the "adequate" category. Thus, the substantial scholastic disparity between these groups contrasts with their intellectual similarity, suggesting that within the I.Q. and MCAT Score ranges obtained, factors other than the intellectual are contributing strongly to the performance of students in their first year of medicine at McGill University.

This aspect received further emphasis in the analysis of relations among the measures of intelligence, aptitude, and academic standing. For the control group, no significant association between rank and intelligence or aptitude was revealed, again suggesting that intellectual factors were not contributing significantly to the scholastic success of these adequately functioning students. For the counseled group, however, aptitude and intelligence were related to academic performance.

One reason for this finding stems from the fact that a much broader range of ranks and a slightly greater dispersion of I.Q.'s in the counseled sample than in the control group allowed correlations to

occur more readily. As mentioned earlier, the counseled group was heterogeneous in composition. A small number was referred by the Dean of Medicine because of examination failure. Such individuals showed marginal ability on the WAIS and MCAT as well as low academic standing. Thus, their scores would have enhanced the correlation values obtained among the three measures in the counseled sample.

Since the groups were, for the most part, similar in their test scores, the above factor alone does not appear sufficient to explain the comparatively strong associations found among the three variables in the counseled group. Further inspection of the data suggests that the correlations would have remained quite substantial had the influence of the scores and ranks of marginal students been removed. A case in point was the strong relation demonstrated between Performance I.Q. and MCAT in the counseled sample. This contrasted with the relatively weak association between these two measures in the control group. Since the MCAT is essentially a verbal test, its significant relation to the Verbal I.Q. would be expected. Furthermore, a low correlation between the MCAT and Performance I.Q. would also be anticipated, since Verbal and Performance I.Q.'s were not related in either the counseled or the control group. The significant association between the MCAT and Performance I.Q. in the counseled group, therefore, is a particularly discrepant finding. One possible explanation, which should be explored further, lies in the fact that both the MCAT and Performance Scale of the WAIS have time limits, whereas the WAIS Verbal Scale does not. For disturbed individuals this aspect can be stressful, and its effects in the two test situations may be such as to relate the scores obtained. In itself, the difference found between the control and counseled

samples in the relation of the MCAT to Performance I.Q. may prove useful as an aid in the early identification of students who will need counseling. It would be necessary first to establish that such a difference pertains between large samples of adequately performing medical students and those receiving help.

#### SUMMARY AND CONCLUSIONS

It has been demonstrated that students who differ significantly in academic rank in the first year of Medicine are essentially similar on measures of intelligence and aptitude. In scholastically successful undergraduates, no significant relation was revealed between intelligence and aptitude scores on the one hand, and academic standing on the other. In students requiring counseling, however, significant correlations between these variables were obtained. Since intelligence and aptitude scores were similar in the two groups, the effect of intelligence and aptitude on the academic performance of these students appears secondary to other influencing factors. What is called for, then, is a study which will identify and assess those nonintellectual variables which obscured or enhanced the relations among the measures of intelligence, aptitude, and academic rank in the present investigation. Such factors may be primary in their influence on scholastic performance in medical school because of the relatively high intellectual and aptitude

levels demanded of students as a prerequisite for admission.

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## The Use of Private Patients in Medical Education

ROBERT A. MACBETH, M.D., M.Sc., F.A.C.S., F.R.C.S.(C),\* and  
WALTER C. MACKENZIE, M.D., C.M., M.Sc., F.A.C.S., F.R.C.S.(C)†

University of Alberta, Edmonton, Canada

A great deal has been written in the last few years, and doubtless more will appear in the years to come, lamenting the disappearance of the public ward charity patient and forecasting the consequent death of medical education. Over the course of the last 36 years, the University of Alberta Faculty of Medicine has maintained a Grade "A" accreditation and graduated 1,339 physicians in spite of the fact that 95.7 per cent of the admissions to its four affiliated general hospitals are occupied by private paying patients. Recent articles on medical education would suggest that this situation is somewhat unique and is, in fact, a predicament which many schools view with alarm as a possible universal development in the years to come. This growing alarm has been the stimulus which has prompted us to record our experience with private patients as instruments for undergraduate teaching and outline a plan of teacher-patient-pupil relationship which in our hands has been successful.

It is probably desirable at the outset to define the terms "private" and "public" patients as they will be used in this presentation. A private patient is one admitted to hospital at the request of, and under the direct care of, his personal physician or surgeon and who, regardless of the type of physical accommodation he occupies in the hospital, will be billed personally by his doctor for service rendered. A public patient, on the other

hand, is one admitted by way of the out-patient department to a ward service. He has no choice in the selection of his medical attendant and is only nominally under the care of a member of the attending medical staff who will submit no bills to the patient for such professional service as may be rendered by him or under his name.

In order to make this presentation meaningful, it is probably necessary to give you some idea of the physical facilities for clinical teaching at the University of Alberta. The primary clinical workshop is the 1,152-bed provincially operated University of Alberta Hospital. This hospital is a closed hospital, and every member of the medical staff is an integral part of the Faculty of Medicine of the University of Alberta. The professor and head of each clinical department at the University is automatically the director of the same clinical department in the hospital. The whole hospital is, therefore, a teaching unit, and every patient in it is potential material for student instruction. Approximately one-half of the clinical teaching load is carried by this one hospital. The University of Alberta group of teaching hospitals, however, includes three additional general hospitals, the 729-bed city-operated Royal Alexandra Hospital, and two denominational hospitals with a total bed capacity of 845. In each of these three hospitals a selected group of clinicians hold University appointments and as such form the teaching unit within the hospital. Appointments to these units are made jointly by the Medical School and the hospital concerned. It is usually,

\* Professor of Surgery, Faculty of Medicine, University of Alberta.

† Dean of the Faculty of Medicine, University of Alberta.

TABLE 1  
ADMISSIONS  
UNIVERSITY OF ALBERTA TEACHING HOSPITALS  
1959

Hospital	Beds	Admissions 1959	"Public" Patients 1959	D.V.A. Patients 1959
University of Alberta Hospital	1,152	22,042	933	2,377
Royal Alexandra Hospital	729	24,000	0	0
Edmonton General Hospital	443	16,145	0	0
Edmonton Misericordia Hospital	402	14,102	0	0
Totals:	2,726	76,289	933	2,377

though not invariably true, that the chief of each departmental unit in each of these hospitals is also the director of the corresponding hospital service.

The figure of 95.7 per cent private patients in a university group of teaching hospitals probably requires some further clarification. The data for a typical year, 1959, is summarized in Table 1. Of the four teaching hospitals in our group, with a total bed capacity of 2,726, the University of Alberta Hospital alone operates an out-patient department. We include Department of Veterans Affairs patients in the public patient group for purposes of this discussion, since they have no choice of medical attendant and are not billed personally for services rendered. This seems particularly applicable, since the care of veterans is in the hands of members of the Medical School teaching staff and they are housed in a wing of the University of Alberta Hospital. In any case, our focal point today is the remaining 72,979 "private" patients who must obviously support a large portion of our undergraduate teaching program. It should be mentioned that, whereas all private patients may be looked upon as the potential pool of teaching material, this situation is completely true only in the case of the University of Alberta Hospital. The major share of the undergraduate instruction in the three associated hospitals is carried out on the private patients of members of the teaching unit in that hospital. This is not to say that the private patients of physi-

cians who are not members of the teaching unit cannot be and are not used. They frequently are used for teaching exercises. However, their utilization is much less than that of patients on the teaching units, and this fact must be kept in mind in interpreting the over-all figures presented. Figures on the admissions to the teaching units are unfortunately not available.

We make no apologies for our extensive use of private patients in medical education, since it is our belief that they constitute exceptionally fine teaching material. The benefits inherent in the use of such patients may be summarized as follows:

1. This is the type of patient that will eventually constitute the bulk of the students' future practice. Is it not fitting, therefore, that his major exposure should be to private patients?
2. It is our observation also that private patients are better witnesses and, as a rule, present disease states at an earlier and consequently educationally more valuable stage in their morbid process than many of us were accustomed to see on the charity wards in days gone by.
3. The teacher, when using private patients, must exemplify for the student the ultimate in physician-patient relationships to maintain the patients' co-operation and consequently create an optimal educational experience. On all sides today one hears expressions of concern regarding the deterioration of this doctor-patient relationship, the so-called

lost "art of medicine." Curriculum committees have even given consideration to the introduction of new courses on this subject; but is this the answer? In days of old when the preceptorship system of medical education flourished and the science of medicine was in its infancy this art reached a peak. One can only assume that it was handed down from generation to generation as a result of the intimate association of the student with his master in the course of the teachers' dedicated, though often ineffectual, ministrations to the sick. We are suspicious that it may just be possible that the busy out-patient department may be one of the important factors in the deterioration of this art and that small group or even individual teaching exercises on private patients may give us back something that curriculum committees cannot legislate.

4. Total patient care, or if you prefer the term comprehensive medical care, is more readily apparent in the relationship of the doctor to his private patient than is the case in most out-patient departments where, if it is present at all, it is often artificially produced through an elaborate integration of representatives of the behavioral sciences—social workers, sociologists, psychiatrists, et cetera.

While you may, or may not, be prepared to accept these possible advantages of the use of private patients for undergraduate instruction, we realize that the major concern of medical educators today is not whether private patient teaching is the equal of charity ward teaching. The important question is, will private patients permit themselves to be used for teaching on a scale that will satisfy the total needs of medical education? We believe that our experience would indicate that they will. We would suggest, for your consideration, our firm belief that the success or failure of private patient teaching depends far more

on a reorientation of the philosophy of our medical teachers than it does on the assumed resistance of the private patient himself.

Clinical teaching, in our hands, takes one of two rather broad forms, and the preparation necessary for the successful conduct of such an exercise and the private patients' reaction to it are worthy of consideration.

*The preceptorship program.*—We feel that the preceptorship program, in one of its many forms, is the essential basis for the integration of private patients into the sphere of undergraduate teaching. Students at the University of Alberta in their clinical years are intimately integrated into the patient care program as an essential part of the medical team along with the intern, and resident trainees. It is frequently true that the undergraduate student is the first member of the team to contact the patient, and our attending staff expect and encourage the student to examine all patients and contribute to the discussions regarding the diagnostic and therapeutic plan for the individual case.

Time has brought about a re-education of our clinical teachers to the point where they automatically call their student or students to participate with them in every area of patient investigation and care. While the students are on the wards most of the day and available to see routine admissions, it is interesting to us that clinicians and residents, by second nature, telephone students at night to acquaint them with unusual clinical situations occurring on the wards in which they might be interested.

It may not be out of place at this time to relate to you a true story which I think indicates the degree of integration that is possible. Last year a member of our third-year class, while on his medical trimester, was advised of the admission of a patient to one of his clinicians. The student proceeded to visit the patient

and, as is the custom, obtain and record a complete history and physical examination in preparation for the discussion with reference to the management of the case which invariably follows. The fact that this patient was a private patient and obviously a lady of considerable means never disturbs our students, who regard all patients as equal and deserving of the very best that their degree of experience can offer. After the examination, which I might add included a rectal examination, the patient commented that this was the most thorough examination she had ever had and she endeavored to remunerate the student for his services.

Although this is a most unusual experience for a medical student at any stage in his training, we believe that this is another indication that private patients will willingly submit to student evaluation. In addition, we do not limit the extent of the student's examination but feel rather that it should depend on the rapport of the student with the individual patient. The success of such a program depends upon attention to the development, within the individual student, of an approach to patients and an ability to assess situations which will lead automatically to the creation of satisfactory patient-student rapport. This is the most important building block in our conception of the preceptorship program in medical education.

*The clinic.*—In this situation, a group, usually of no more than three or four students, is taken to the bedside of the patient, or on rare occasions the patient may be presented to a group of 50-60 students in an amphitheatre. In the majority of cases, the patient being demonstrated is the private patient of the physician conducting the clinic, and the preliminary arrangements for the presentation are reasonably straightforward. It is our contention that the emphasis which has been placed on whether or not the patient participating in this type of

teaching exercise is directly under the control of the teacher involved is not as important as many would have us believe. We will endeavor to present a plan which, in our hands at least, has enabled the clinician to make use of any patient on the teaching unit. It is in this type of teaching situation that we use a five-point program to obtain the cooperation of the patient and, where applicable, his attending physician. The approach will vary somewhat with the circumstances, and I should possibly say that we do not consciously approach the matter with such mathematical precision. It was only when we sat down to analyze why we had no significant problems in the use of private patients in student teaching that we suddenly realized these simple truths. The procedure which we have used for years, and which was based on common courtesy rather than premeditation, did, in fact, have five essential steps:

1. If the patient to be presented is not the clinician's own patient, he first contacts the patient's attending physician in advance of the presentation and obtains his permission to use the patient. To my knowledge permission has never been withheld in our school except when the patient's condition would make the contemplated teaching exercise medically hazardous. This procedure avoids interphysician irritation, often provides the teacher with essential information about the patient not available on the hospital chart, and gives the attending physician an opportunity to prepare the patient for the next step. It is appreciated that this step will probably be the most difficult if private patient teaching is a new venture. Our doctors have had 36 years' acclimatization to such an approach, which makes the task easier. The attending physician soon learns, however, if the subsequent four steps are followed, that he loses nothing by his cooperation, and each successive time he is approached his cooperation is easier to obtain.

2. The teacher next personally visits the patient. The conduct and content of this contact are of the utmost importance. After the initial introduction, which is usually done by the ward nurse, the teacher explains the reason for his visit and assures the patient that his attending doctor is agreeable to the patient's participation in the teaching exercise as long as the patient himself is willing. The size of the student group and the physical situation in which the clinic is to be conducted are outlined in detail. Exactly what will be expected of the patient is carefully explained. If physical findings are to be demonstrated, or if students will take part in the examination, this is carefully described to the patient. During this careful explanation of the conduct of the clinic, the patient is constantly made aware of the valuable contribution that his presence will make to the educational experience. He is also assured that nothing will be done which will be injurious to his condition or cause him pain. It has been our experience that patients who know exactly what the teaching exercise will consist of have been most cooperative and helpful during the course of the clinic.

3. The patient is introduced to the student group, individually if this is feasible, and comment is made expressing the clinician's appreciation that the patient has volunteered to participate in the teaching exercise.

4. It is of extreme importance that, during the patient's presence, the focus of attention be on the history and the physical examination. We have been surprised to find that this may be very thorough without irritation of the patient. Care is exercised that nothing is said or done that would undermine the relationship of the patient and his attending doctor. Controversial points regarding diagnosis and treatment which might interfere with this most important

relationship are not discussed in the presence of the patient.

5. The patient is sincerely thanked for his contribution to the teaching exercise.

Doubtless much of the facility with which our private patients fit into the over-all teaching program is due to their 36 years of acclimatization to this system. Almost every patient entering an Edmonton hospital, regardless of his ward status, expects to be used for student instruction. Our observation that this expectation is associated with anticipation rather than antipathy leads us to believe that our philosophy regarding teacher-patient relationships over the years has been well founded.

There will always be new challenges in medical education as long as the profession continues to serve. It should be a source of great satisfaction to all of us as medical educators that, while we do live in an era of challenge and change, we are actively pursuing the ways and means of serving effectively and are modifying our programs to fit the changing pattern of medical and hospital care. Medical educators who are already accustomed to the use of private patients for teaching purposes no doubt feel, as we do, that the current controversy over the use of private patients for teaching is out of proportion to the problem itself. Certainly it demands a little more time and a little more consideration of the rights of patients as individuals than is often in evidence on public ward services, but in return the dividends are greater. Many programs designed to integrate private patients into an optimal undergraduate teaching experience will doubtless be forthcoming in the future. We have attempted to outline one possible approach to this problem. As we see it, no major problem exists, although nowhere is it more true than here that attention to small things brings success, although success is no small thing.

# MEDICAL EDUCATION FORUM

## Editorials

### MEDICAL SCHOOLS

Several months ago in conversation with a well known surgeon in San Francisco, we brought up the problem of medical education and the need for new medical schools, and the difficulty of laboratory space and staffing, particularly in the first 2 years. We discussed our several 2-year medical schools and noted, furthermore, that many of our universities have first-class departments of biology and chemistry which could be readily expanded to cover the basic sciences in Medicine, including human anatomy. Then the question, why not go one step further and consider another group—a group of the usual 4-year medical schools which have excess facilities and staff for the clinical years beyond their present needs; therefore, there would be two sets of 2-year schools. This program is now in being in a very large measure between Dartmouth, with its primary 2 years, and Harvard and other Boston medical schools.

Another facet of the program is the individual development and expansion of larger hospitals affiliated with medical schools in some of our cities. Here again Boston is a good example. Hospitals affiliated with Harvard are: Peter Bent Brigham, the Massachusetts General, the Beth Israel, the Childrens', the Free Hospital for Women, and the Boston Lying In Hospital. The last three of these are specialty hospitals. In addition, there is the very large Boston City Hospital with Harvard services in medicine and surgery; and this hospital is also "cross fertilized" by affiliation with one or two other schools. These hospitals have free appointment of their staffs and relieve the university in some measure in payment of them. The heads of the departments in the larger hospitals are given professorial status in the Harvard Medical School. Here we have a well integrated system with the Medical School of the university as the central body, covering the educational requirements of the first 2 years and then distributing the students among hospitals which are in close affiliation with the school. Unlike the British medical school, these are not "hospital" medical schools, since their staffs and facilities are concerned only with the final clinical years and then, of course, with postgraduate phases of medical education.

In excerpts from the Report to the President of the Josiah Macy, Jr., Foundation, November 16, 1940, Dr. Willard C. Rappleye, former Vice President for Medical Affairs of the College of Physicians and Surgeons, Columbia University, and before that the Dean of the same school, there is almost identical statement:

The possibility of developing more of the schools of basic medical sciences, to so-called "two year schools," holds real promise. A number of the four year schools can take more students in their third and fourth years than they can accommodate in the first year of the medical course because of the bottleneck of laboratory space and instructional staff in that and the second year and the availability of extra clinical facilities in the last two years of the medical course. Some of the large universities

without medical schools already have nearly all the facilities and staff to provide the first two years of medical course upon completion of which students could transfer to the third year of a full four year school. The amount of hospital facilities and clinical staffs in many big cities not now used in medical instruction is an open invitation to develop quickly many new resources for medical education at reasonable cost and to the benefit of those hospitals, the local communities and the nation. Such development would be consistent with the upward extension of medical education into the hospital internship and residency programs, now including over 40,000 graduate medical students, and into continuation education of physicians in practice, all of whom are parts of the whole spectrum of present day medical education.

We already have added possibilities for the basic science years through expansion of the departments of biology in many of our universities, together with the two year medical schools already in being. By further utilizing the more than adequate clinical facilities in our larger centers, together with controlled outlying hospitals through staff and teaching facilities, could not the present stringency in medical education be greatly relieved without the great expense and longer period of time necessary for the development of a new medical school?

As one observes new medical schools as they develop, they are never happy in their earlier years, and one might say it takes almost a generation for the city and its local profession to become acclimated to its new medical school, its needs, and the necessary philosophy. Practitioners in many cities may honestly believe that they want a new medical school, and yet when the new school develops, they find that they are suddenly left out in the cold, and so become dissatisfied. One cannot order a medical school into being, whether by federal, state, or military fiat. It takes years for its slow development to maturity and full blossoming. By the method suggested in the above paragraphs, much time can be saved. The course of medical education will be easier by the avoidance of hurt feelings on the part of many.

FRANK B. BERRY, M.D.

#### PEDAGOGY IN MEDICAL EDUCATION

During the week of June 12th, 1961, at the Shoreland Hotel in Chicago, faculty members from United States and Canadian medical schools will have the opportunity to participate in the Seminar on Medical Teaching sponsored by the Association of American Medical Colleges. This is the fourth of these seminars to be given under the leadership of Dr. George E. Miller, Director of Research in Medical Education and Associate Professor of Medicine at the University of Illinois College of Medicine. In 1960, the A.A.M.C. was the sole sponsor of the seminar and in the two years prior to that joined with the University of Buffalo Project in Medical Education in sponsoring this important educational effort. Up to the present, 95 faculty members from 45 United States medical schools and two Canadian medical schools have had the privilege of participating.

The Seminars in Medical Teaching have been outstanding in that they have permitted teachers of both basic and clinical sciences to sit down with professional educators who were familiar with the goals, opportunities, and problems of medical education. Subjects which have been presented have included the principles of learning, defining educational objectives, curriculum design, instructional meth-

ods, appraisal of student progress, and criteria of good instruction. Those of us who have had the privilege of participating in one of these seminars are deeply grateful to Dr. George E. Miller, the University of Buffalo College of Medicine, and the University of Illinois College of Medicine for the establishment and continuation of these significant efforts. We are happy, too, that the Association of American Medical Colleges has been able to make this opportunity available to our teachers of medicine.

G. N. AAGAARD, M.D., Dean  
*University of Washington*  
*School of Medicine*  
*President, Association of*  
*American Medical Colleges*

## Datagrams\*

### EXPENDITURES OF THE FOUR-YEAR MEDICAL SCHOOLS IN THE U. S.—1959

Figure 1 and Figure 2 on the following page were constructed from the expenditure data reported by the four-year medical schools in the U. S. for the year 1958-59. Figure 1 shows, on the left side, expenditures for the 44 private medical schools from funds available for basic operations, ranked in order of dollar amounts of expenditures, and on the right side, the corresponding dollar values of expenditures from funds designated for sponsored research. (The percentages indicate the proportional relationship between the amounts expended from funds designated for research and those available for basic operations.) Figure 2 provides the same information for the 37 public medical schools.

Comparison of the two figures reveals that so far as expenditures from funds designated for *sponsored research* are concerned, the average expenditures for the private schools are greater than those for public schools, i.e., \$1.6 versus \$1.2 million. The reverse is true for expenditures from funds available for *basic operations*: \$2.6 million for public and \$2.4 million for private schools.

It is also very apparent that while those schools with high expenditures from funds available for basic operations tend also to have large expenditures from funds designated for sponsored research, the extremes in range for both types of expenditures are great.

Expenditures from funds available for basic operations range from less than \$1 million to approximately \$6.5 million for the private schools; from \$1.1 to \$6.6 million for public schools. Expenditures from funds designated for sponsored research vary from \$0.2 million to \$5.5 million for private schools; from \$0.1 million to \$4.3 million for public schools.

The proportional relationship of funds designated for sponsored research to those available for basic operations varies widely from school to school. This variation ranges from 15% to 120% for private schools (Fig. 1) and from 8% to 127% for public schools (Fig. 2).

The above noted discrepancies between the expenditures for private and public schools, and the complete dissimilarity in the amounts and proportional relationships between the two types of expenditures suggest that medical schools may not recognize any common policy or objectives concerning the extent to which expenditures for sponsored research should be related to their other responsibilities. As our schools undertake to review such questions, it is important in each instance to appreciate the total investment that is being made in research. It is well known that expenditures from funds designated for sponsored research represent but a portion of the cost of a school's total program of research. For one thing, the indirect costs of sponsored research are greater than the allowances provided for them in the grants. The average allowance for indirect costs on all grants for sponsored research for all schools in 1959 was approximately 12%. For the year 1958 the National Science Foundation, using the "Blue Book Formula," established that the actual range of such indirect costs varied between schools from 18% to more than 50% of the grants, with an over-all average of 25% for all schools. (See Datagram Vol. 1, No. 12, June 1960.)

But more important than this, early returns from the Association's study of program costs indicate that the total net investment in research per school, over and above the amounts from sponsored grants and the overhead allowances provided, range from \$133,753 to \$1,405,000. The returns are not yet sufficient to ascertain whether there exists any consistent correlation between the size of a school's sponsored research program and the net financial impact upon funds available for its basic operations. Undoubtedly in many instances it will be considerable.

All of this emphasizes the importance of the Association's study of medical college program costs that is presently under way. While figures indicating the total expenditures (see Datagram Vol. 2, No. 8B, February 1961) and expenditures by source of income (see J.A.M.A. Vol. 174, p. 1433, Nov. 12, 1960) are important, their proper use for re-evaluating objectives and planning for the future can only be accomplished in light of the knowledge concerning costs—and also the facts that explain the costs—of each of the many educational, research and service programs that characterize the manifold responsibilities of the modern school of medicine.

\* Submitted by the Division of Operational Studies of the AAMC.

Expenditures from Funds Available for Basic Operations and from Funds Designated for Sponsored Research for Each of 44 Four-Year Private Medical Schools and 37 Four-Year Public Medical Schools — 1959

BASIC OPERATIONS \* PRIVATE SCHOOLS SPONSORED RESEARCH

(MILLIONS OF DOLLARS)

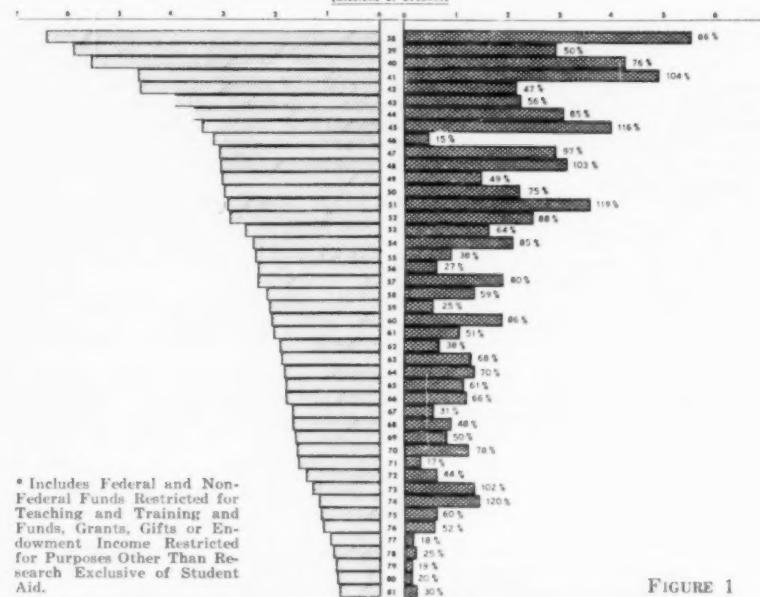


FIGURE 1

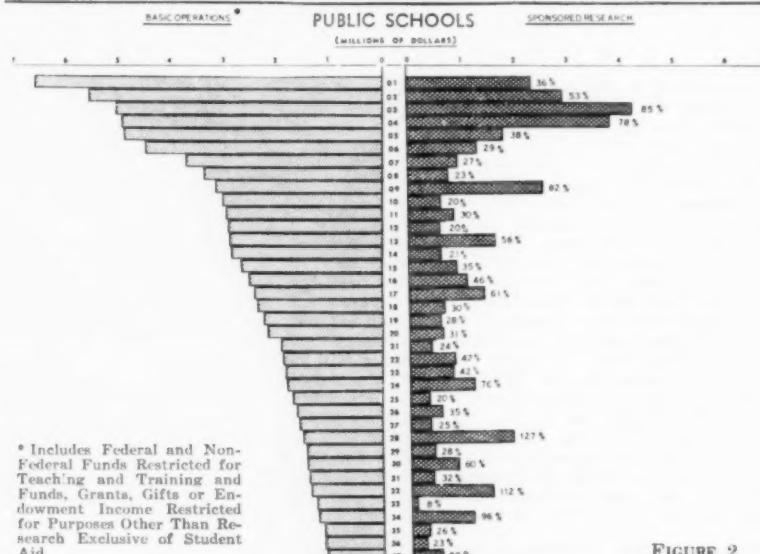


FIGURE 2

\* Includes Federal and Non-Federal Funds Restricted for Teaching and Training and Funds, Grants, Gifts or Endowment Income Restricted for Purposes Other Than Research Exclusive of Student Aid.

## Communication

### THE DETERIORATION OF CLINICAL MEDICINE

PHILLIP E. ROTHMAN, M.D.\*

For the past two decades the medical profession has participated in a series of remarkable scientific advances and at the same time has been the target of an increasing number of justifiable complaints. The complaints concern a deterioration in the physician-patient bond of mutual esteem and confidence; the development of a new order in which the doctor is no longer a physician first and a specialist afterward; and a lack of adequate patient supervision so as to assure a consistently high quality of medical care. If it is a source of dismay to the laity that some aspects of medical practice are deteriorating in the midst of great scientific progress it is also a matter of deep concern to the medical profession. An editorial in the *New England Journal of Medicine* states, ". . . the profession of medicine has had once again brought to its attention a growing suspicion that its science is running away with its art; that its relations with the people it serves are not always as close or as agreeable as they should be and that the hour may be later than it seems."<sup>1</sup>

In an attempt to understand present difficulties it is helpful to recall some of the factors responsible for the changes that have occurred. Notable episodes are recorded in the long history of medicine when research flourished to a degree that aroused concern over the danger of separating the physician from the bedside of the patient. Strauss<sup>2</sup> has recently described the impact produced by the first biochemical and biophysical schools of medicine in the seventeenth century. At that time it was Sydenham, the English physician, and his followers who affirmed the need for living close to the patient and successfully restored clinical medicine to its proper place. In our time it was Osler, the Regius Professor of Medicine at Oxford, who warned physicians of the limitations of science. In an address delivered at the opening of The Wistar Institute in 1894 he said, "Science has done much, and will do more, to alleviate the unhappy condition in which so many millions of our fellow creatures live, and in no way more than in mitigating some of the horrors of disease; but we are too apt to forget that apart from and beyond her domain lie those irresistible forces which alone sway the hearts of men."<sup>3</sup> Unlike Sydenham's difficulties, the problems that confronted Osler were insurmountable, and with each passing year the situation has worsened.

The leading institutions responsible for medical care are the hospitals affiliated with medical schools, the so-called teaching hospitals. These institutions are now supervised by salaried physicians who are not engaged in the usual type of private practice. This plan, the full-time or whole-time plan, originated in 1913

\* 436 N. Roxbury Drive, Beverly Hills, California.

<sup>1</sup> Editorial, To Comfort Always. *New England J. Med.*, 245:192, 1951.

<sup>2</sup> M. B. Strauss, The Climate for the Cultivation of Clinical Research. *New Eng. J. Med.*, 262:805-10, 1960.

<sup>3</sup> W. Osler, *The Leaven of Science*. *Aequanimitas*. London: H. K. Lewis, 1906.

when the Rockefeller Foundation gave the sum of one and a half million dollars to the Johns Hopkins Medical school "for the purpose of so organizing the departments of medicine, surgery, and pediatrics that the professors and their staffs might completely withdraw from private practice in order to devote their entire time to their respective departments." Many practicing physicians were retained on a part-time basis and continued to contribute their services to the hospitals without financial remuneration. During the early years of the full-time plan the highest quality of medical care was evident within the limitations of existing knowledge. If the present era represents the golden age of scientific progress, the former period may be described as the golden age of clinical medicine.

The early success of the full-time plan has been ascribed to many unrelated factors. In all the hospitals a priority was assigned to patient care, and other activities, particularly research, were of secondary importance. Funds available for research were small; progress was comparatively slow; the total significance of each advance was more completely comprehended. The attitude toward the application of new discoveries to patient care was extremely conservative. It so happened that many department heads were remarkable physicians who in virtue of their extraordinary ability and outstanding personal characteristics exerted an almost incredible influence on the medical profession. They had adequate time to carry out their obligations. Administrative decisions were usually made without the services of a committee. The majority of department heads had been in private practice prior to their full-time appointments and were intimately acquainted with the problems of the practitioner. They were able to counteract successfully the deadening and pitiless aspects of science by means of their own broad education in the humanities. In this environment the teaching of nurses, students, and young physicians was comparatively simple. They learned by example and at the bedside.

Opposition to the introduction of the full-time plan precipitated a bitter controversy. The leader of the opposition was Osler, and his genius is apparent in the accuracy of his predictions and in his words which remain alive and applicable in a changing and growing society. In an address at St. Bartholomew's Hospital he stated, ". . . It is attractive to think of a group of superclinicians, not bothered with the cares of (outside) consulting practice and whose whole interests are in scientific work. It is claimed that as much good will follow the adoption of the plan of whole-time clinicians as has followed the whole-time physiologists and anatomists. Against it may be urged the danger of handing over students who are to be general practitioners to a group of teachers completely out of touch with the conditions under which these young men will have to live. . . . Would there not be the danger of the evolution throughout the country of a set of clinical prigs, the boundary of whose horizons would be the laboratory and whose only human interest would be research?" And in a letter to the Hopkins faculty he wrote, "The ideals would change, and I fear lest the broad, open spirit which has characterised the school should narrow, as teacher and student chased each other down the fascinating road of research, forgetful of those wider interests to which a great hospital must minister."

During the first 20 years that followed the inauguration of the full-time plan physicians who practiced in communities with teaching hospitals often required 5 years or more to establish a modest-sized practice. The slow start provided ample

time to give patients excellent care as well as an opportunity for the physicians to devote many hours daily to the hospital. This experience aided in the development of many highly competent practicing physicians who served their communities well and at the same time kept alive the art as well as the science of clinical medicine in the teaching hospitals. With the great growth of population it soon became evident that the number of superiorly trained physicians was inadequate. To solve this problem each specialty formed a separate organization and increased the number of years of hospital training for qualification as a specialist. Thus, under the old regime additional training was usually acquired in conjunction with private practice or following an initial period of practice, whereas today it is acquired prior to entering practice. The present system has many obvious advantages. However, prolonged training in an institutional environment is not always conducive to the development of qualities essential to a physician. The old system, perhaps, had one advantage of training the heart first and then the mind. Today a physician entering practice after a prolonged training has often assumed obligations that do not permit a slow start, a small practice, and a modest income. The drive necessary to obtain more rapidly the status and rewards so justly deserved does not always serve the patient's best interests. If a large practice is acquired within a short period, a not infrequent experience today, there is little time to contribute to the hospitals and less for the individual patient. Osler's warning that too much private practice early may prove a good man's ruin cannot be heeded and as predicted, "ten years of successful work tend to make a man touchy, dogmatic, intolerant of correction and abominably self-centered."

At the same time, changes were taking place within the teaching hospital that affected patient care. Large sums of money became available for research. The number of doctors engaged in investigative work rapidly increased. Preparation for a career in research demanded a more extensive training in the basic sciences, and this was often obtained at the expense of the liberal arts. A few men in the clinical departments spent their entire time in the laboratory, but the majority assumed the impossible task of research, patient care, teaching, and administrative duties. Strauss remarks that, "although patient care, teaching and research are often spoken of as the three legs of a stool, I wonder whether the analogy of riding three horses at once would not be more apt." It soon became apparent that promotion was based more and more on research achievements. There developed a "curious halo about research," and in general the routine care of patients began to suffer, the status of the clinician gradually declined, and the gap between the full-time physician and the practitioner widened. Special groups of patients, notably those with cardiac, renal, hematologic, and endocrine disorders became the subject of intense investigation, and the benefits were remarkable. Advances in understanding and in the treatment of many diseases followed rapidly, and despite new and serious problems it was an exciting and stimulating era. The complaints and criticisms of the older physicians and of the laity in respect to the insidious deterioration in the attitude toward the individual patient were brushed aside by a new generation who, understandably, refused to disagree with those who had achieved so much.

Research and clinical medicine are not antagonists. All physicians agree with Herrick's statements that "research is the activating catalyzing agent in the

science of medicine. Without laboratory experimental research, medical science will stagnate and the art of medicine will revert to its old status of empiricism.<sup>4</sup> They also agree with his comment that, "many men who are working in research laboratories or wards become poor practitioners." It is the balance between research and clinical medicine that has become profoundly disturbed. The future of clinical medicine is jeopardized as taxpayers prepare to spend a billion dollars annually for medical research with little or no provision made for improving the quality of clinical care. Editorials warn that in the general popular concern for medical research, "The investigative branch of the science has tended to take precedence over the adequate care of the patient. Highly technical information is being produced faster than it can be practically applied, and it is time for a reappraisal of the primary function of the physician, toward which all investigation and all education are ultimately directed—the healing of the sick and the prevention, where possible, of disease."

As early as 1924 Cushing, the distinguished neurosurgeon, perceived that vast research programs indirectly interfered or were permitted to interfere with the adequate care of the patient. In an address before the Congress on Medical Education<sup>5</sup> he stated, ". . . but the obvious answer is that what the students have been taught has no apparent bearing on at least 75 per cent of the countless minor ailments with which they must become familiar—the flat footed headwaiter, the old man with a chronic scab on his lip, the young woman with a backache or a lump in her breast, the baby with convulsions, the workman with an ulcer on his leg or a fistula in his bottom, or, worse, with an infected or injured hand which, improperly treated, may be the end of his wage earning days. There is no end to it—all very trifling, you may say, when we consider the public health movement, and the eradication of yellow fever from the world yet each of these individual people is greatly concerned about his own personal ailment, and the sum total is enormous. With such things the vanishing race of family physicians was once chiefly concerned, while the chiropractor and science healer now take his place."

Four years later in a personal communication to the writer Cushing observed, "However the world is not full of Oslers, unfortunately, and in certain ways the experiment (full-time system) has had some beneficial effects and we may expect the pendulum to swing back again." In this expectation he was in error, for the pendulum has not swung back. Research once more competes with rather than complements clinical medicine in the education of the young physician. Thirty-four years after Cushing's address Munro<sup>6</sup> described a similar group of badly cared for patients traceable to the lack of clinical education of their attending physicians and raised the controversial questions of how much the public is to blame for the injudicious choice of physician or the medical profession for failing to instruct the public in the proper evaluation of their physicians' competence.

Recently there has been a great deal of tinkering with the medical school curriculum, and there is a tendency to arrange courses that will develop investigators, teachers, and specialists in highly advanced fields rather than clinicians. Elvehjem<sup>7</sup>

<sup>4</sup>J. B. Herrick, *The Practitioner of the Future*. *J.A.M.A.*, 103:881-85, 1934.

<sup>5</sup>H. Cushing, *The Clinical Teacher and the Medical Curriculum*. *Consecratio Medici*. Boston: Little, Brown and Co., 1940.

<sup>6</sup>D. Munro, *On Choosing a Surgeon*. *New Eng. J. Med.*, 258:74-77, 1958.

<sup>7</sup>C. A. Elvehjem, *Research and Training*, *J.A.M.A.*, 170:428-32, 1959.

has emphasized that medical students who are plunged as early as possible into the world of research may eventually unravel the mystery of cancer, stem the deteriorations of aging, and help reverse the trend in mental illness but are probably not the ones to choose to bind up a cut finger. Their interest is not in easing pain but rather an understanding of the meaning of pain itself or of the velocity of the blood flow through the cut or even of the effects of an uncleared wound. Their satisfaction is not in direct service but in ultimate service. They are best trained and kept in the laboratory. Unfortunately, many do not remain in the laboratory but enter practice either in the community or participate in the care of patients in the teaching hospitals. They regard investigative work as superior to the practice of medicine in contrast to Osler's contention that the practitioners are the men who are doing the real work of the profession. The result has been a decrease in popularity of private practice. It is estimated that approximately one-third of all physicians hold salaried positions and of the remainder many are dissatisfied with the daily routine of the practitioner. Lippard, the dean of the Yale University School of Medicine, writes, "I also wonder whether the medical school is not becoming the haven for the man who would avoid the rigorous competition of independent practice yet wishes to continue to operate in a narrow technical field, rather than the man of broad background and wide interest who has the capacity to kindle in his students the desire to join in an exciting life venture."<sup>8</sup>

To plunge third- and fourth-year medical students into the world of research is an error, and it is just as serious a mistake to assign them the care of a large number of sick patients. Dock<sup>9</sup> has warned educators that the student learns little of patient care in these 2 years which he would not learn in the first few months of a good internship. It diminishes the time devoted to instruction in fundamentals. The opportunity to care for patients will be open later; the opportunity for careful study will be greatly curtailed after graduation. "A few cases should be studied under favorable conditions, very thoroughly and for as long a time as possible, with emphasis on the application to their problems of the fundamental contributions of the microbiologist, the physiologist and the clinical scientist."

The great advances in medical science have created an enormous amount of new information that must be taught to house officers in addition to knowledge of diseases that have been nearly eradicated. The so-called conquered diseases never entirely disappear, and although failure to recognize and properly treat these disorders may not be statistically weighty, nevertheless, in the individual case an error may become a catastrophe. The house officer no longer learns by example from his "chief," since all department heads are so harrassed by administrative duties that they appear infrequently on the wards and are often unable to carry out the original concept of the full-time plan, namely, to be "free to render any service required by humanity or science." "The younger full-time man is unable to devote his best energy to teaching when he knows that other considerations shape his destiny more importantly. It is not only that personal achievement may perish if he fails to pursue his avocation (research) with vigor; The reputation

<sup>8</sup> V. W. Lippard, The Medical School—Janus of the University. *J. M. Educ.*, 30:698-706, 1955.

<sup>9</sup> W. Dock, The Medical School's Relation to the University and to the Practice of Medicine. *J. Assoc. Am. Med. Colleges*, July, 1948.

of his school may also suffer." During his service on the wards his interest is chiefly in the few patients whose diseases have research possibilities. Burwell, a Research Professor at Harvard, recently stated that "full-time teachers not engaged in active practice cannot by themselves impart to students an adequate interpretation of the problems of medicine. They need and will continue to need, the understanding, the participation, and the collaboration of their part-time colleagues who are actively in practice in the community."<sup>10</sup> This type of collaboration has been practiced since the beginning of the full-time system. It was originally successful when the part-time physicians were trained by excellent clinicians. Today the education of young physicians is principally delegated to a group of subspecialists who teach the refinements of a narrow speciality to students who have not been thoroughly grounded in the fundamentals. These teachers are not obligated to live by the practice of medicine, and few appreciate how far life itself diverges from the printed page or spoken line. The deficiencies in teaching cannot be remedied by the present part-time staff who are the former pupils of the full-time subspecialists. The recipients of this type of education are responsible for the complaints of the laity mentioned in the opening paragraph, although their knowledge of medical facts greatly exceeds that of all past generations of physicians. This state of affairs has been described by Heckscher, "Something has gone out of even the best medical schools, the old sense of general training, of preparation for a liberal profession, has been weakened. The amount of knowledge that must be crammed into the head of a medical student today is so vast and varied that the nature of learning and teaching has been transformed from what it once was. The philosophy of things has been sacrificed to their details. The trade school has taken the place of the academy. No one, I think, can talk with the younger generation of doctors without sensing among them a discontent with the narrowness of their interest. Their minds have been sharpened, but not broadened, and they go out with a very meagre feeling for the things of the world that lie beyond their sphere of specialization."<sup>11</sup> A few teaching institutions openly discourage the admission of patients whose problems do not lead to research investigation. This policy is in sharp contrast to the attitude expressed in a commencement address by Corner, a Director at the Carnegie Institution: "... Every person that comes to your wards or dispensary, everyone that calls at your office or sends for you as doctor and nurse, does so because he has a private, individual sickness or pain or worry. Rich and poor, white and black, wise and foolish, each comes hugging his own ills, his own fear or sorrow. It is your task, your hard lifelong task, to give each his need of personal understanding and individual thought."<sup>12</sup>

From 1913 to the present time members of the medical profession in high positions have actively combated the deterioration of clinical medicine without any noticeable effect. Stokes, a British visiting physician to one of our teaching hospitals, recently recorded his impression that in the United States "the physician seems more interested in the acquisition of medical knowledge, the search after truth, than in the relief and prevention of suffering in patients who come

<sup>10</sup> C. S. Burwell, Medicine as a Social Instrument: Medical Education in the Twentieth Century. *New England J. Med.*, 244:673-81, 1951.

<sup>11</sup> A. Heckscher, Medicine and Society. *New Eng. J. Med.*, 262:19-23, 1960.

<sup>12</sup> G. Corner, The Focal Point in Medicine. *Univ. of Tenn. Record*, 50:114-19, 1947.

under his care."<sup>13</sup> The lowered mortality in many diseases and the efficacy of new therapeutic agents are such dazzling achievements that many young physicians simply cannot believe that there is anything wrong with the practice of medicine or that the complaints of the laity are justified. Former values have disappeared, and an inferior type of medical care is often accepted by individuals who previously had demanded only the best. The editor of the *Saturday Review* comments that, "If a man becomes ill he hardly hangs up his hat in the doctor's office before he is placed before a whole battery of machines and testing devices. The traveled road is not between the mind of the diagnostician and the heart of the patient, but between the clinic and the laboratory. There comes to mind Castiglione's admonition that the post of honor for the doctor is at the bedside of his patient." One professor of medicine writes that we cannot impute to the teaching hospital all the deficiencies society seems to find intermingled with the excellencies of medicine. Some of the criticism he states can be directed back at society whose material values are most cogently exposed when personified in the physician. Whether this is true or simply a weak excuse is difficult to say. Nevertheless, in an era when the department head is often an administrator and skilled committeeman and the full-time teacher is occupied with research and the part-time man is overwhelmed by his patients' demands, the house officer is left without an example or potent influence in the development of his character. Perhaps the old criticism of over-specialization has some merit, but it is generally believed that the rise of specialism appears as a natural accompaniment of increased knowledge. Stebbins has emphasized that an important factor in the increase in specialism is "the natural human drive toward excellence. The satisfactions derived from superior accomplishment are a powerful incentive, even though this may mean a restriction in the field of activity." It is the department head who must prevent the abuse of specialism mentioned in Sir James Mackenzie's oft quoted observation, ". . . that helpful as this specialism has been in many ways, nevertheless instead of enlightening, it tends to darken understanding in a cloud of detail." All too often on ward rounds or at the daily conference "the patient is smothered under the weight of learned chatter."

Powerful impersonal forces contribute to the difficulties of maintaining adequate patient care. The tendency of salaried physicians toward an 8-hour day and a 5-day week with house officers in most hospitals working only one night out of three or four or even five often leaves the patient under the supervision of a strange doctor who has only a fragmentary knowledge of his illness. New and seriously ill admissions usually receive excellent care, but the routine work suffers badly. Not only does the break in continuity of observation affect the patient, but it is a serious obstacle in the education of the physician. This system has a devastating influence on the man who is about to enter practice and theoretically provide his patients with 24-hour service. The teaching hospital must now engage 2 or 3 times the number of house physicians formerly employed for the same number of patients in order to take care of the night shift. An explanation for the existing plan appears in the Bulletin of the University of Cincinnati Training Program in Psychiatry for 1960. It states, ". . . residents must work hard, and long hours, but at the same time must have ample opportunity to play, to be with their fami-

<sup>13</sup> J. F. Stokes, A British View of an American Hospital. *New Eng. J. Med.*, 260: 69-71, 1959.

lies, to have an adequate social life. It is urgent, in the maturation of residents, that over three or four years they should not work on an average more than one night out of four or five. They need to have a chance to think, to grow, to be with other people, to develop their leisure and their hobbies . . ." One can only conclude that, if it is true that this generation of physicians is more concerned with their rights than with their obligations, they are certainly aided and abetted by their teachers.

The great increase in the number of diagnostic laboratory tests and the remarkable improvements in roentgenology as well as in many instruments of precision have taken place at the expense and sacrifice of a careful history and a competent physical examination. An increasing dependency on laboratory procedures has permitted "sound clinical judgment to shrivel up from disuse." So much has been written on this subject—the abuse of the laboratory—that any additional admonitions are generally considered futile, since no one sets a good example. Less unnecessary laboratory work was performed during the financial depression of 1929 when the patient could not afford the expense, and this was also true in the European hospitals during and after the last world war. It is the general impression that the art of clinical medicine advanced during these years. Today, with a good part of the expense of laboratory procedures covered by medical insurance, it is almost impossible to resist the temptation to order a few additional tests. Even satire is without effect, since a medical wit has portrayed the modern intern as a physician who spends his mornings collecting specimens from his patients for analysis and his afternoons draped around the telephone waiting for the reports to come in from the laboratory. The situation was summarized years ago by Hamman, one of the former great clinicians, who wrote, "It takes little time and is no tax at all upon the mind to order numerous tests and swiftly tabulate the morbid conditions they reveal; whereas it requires great patience and much serious thought to gather the particulars of a patient's constitution and environment and to assemble these data into a background for the illness. The busy practitioner . . . cannot afford the necessary time, and as a rule the consultant is preoccupied with the search for recondite lesions."

The revolutionary changes that followed the introduction of the new antimicrobial drugs have had a profound effect on clinical medicine. It is now possible, for example, in the treatment of infections such as pneumonia, to make only a casual examination of the patient, to give scant attention to physical signs, to disregard almost entirely the details of diet, the administration of fluids, and general nursing supervision, and in many instances obtain results that are more remarkable than were ever imagined by the greatest physicians of the past. Such experiences develop a tendency toward a careless attitude on the part of the physician, and this is practically impossible to combat. Any evaluation of the over-all management of the patient becomes difficult and sometimes impossible in the presence of a successful end-result. Again, it is apparent that each advance creates new and serious problems.

Consultations today consist largely of sending patients to teaching hospitals. Lord Moran, the former president of the Royal College of Physicians, has stated that this is the chief cause of the decline in status of the practitioner. "It is mortifying," he said, "to the physician to find that the patient no longer puts his trust in him and feels that when he is seriously ill he is well advised to go to a

hospital and be treated by strangers." The local physician gains little knowledge from the case; the patient-physician relationship is disturbed; and, most important, the patient suffers because no one individual is in charge. This system was unavoidable 15-20 years ago when each new subspecialty was represented by a limited number of physicians. Today there is an abundance of specialists and subspecialists in all fair-sized communities, and it is time to change to a more valuable type of consultation. This concept holds that a consultation is not just a matter of sending the patient away for a second opinion. "It is only a consultation when a practitioner and specialist meet together to consult." "With the increasing number of specialists, teamwork has become the modern slogan but the attending physician who should hold the reins and be the captain is all too often not a member of the team." If the attending physician is not capable of holding the reins the fault is partly his but his teachers and consultants must share the blame. Consultations with good practitioners "beyond their value to the patient are mentally stimulating to the consultant and have great educational value for the physician who calls him. They demand the highest quality of mind and heart and always the great medical teachers of the past have been great consultants. They extend the influence of the school beyond its students to the profession of the community. They likewise keep the teacher in touch with the point of view and needs of the practitioner . . ." Thus the consultant must go to the patient's home or to the practitioner's hospital, and when the special facilities of a teaching hospital are required the practitioner should receive temporary courtesy privileges so that each day he and the specialist may see the patient together. The present practice of transferring the patient to a full-time physician in a teaching hospital tends to divide the profession into two classes, and this is as unhealthy for the profession as are two classes of citizenship for a country. The public is beginning to realize the fallacy of artificially created classifications of physicians. "In the final analysis a physician's competence, as such, really rests on the concensus of his professional colleagues and trainers that he is qualified. His proven value to his colleagues and patients is the only adequate test." His reputation among his fellow physicians is maintained by the character of his work, and not by his titles or by the diplomas displayed on his office wall.

It must also be obvious that the quality of medical care is not related to the various plans of organization such as group practice, pre-paid plans, union-paid medical care, socialized or government paid medicine, full-time hospital groups, or individual practice. "Medical care is dependent on two things: first, the character of the physician, second, his education. And it is not dependent on the method by which the doctor is paid" (Veeder).

Some members of clinical departments primarily concerned with research find, as time goes on, that their sensitiveness toward patients has become blunted. Certainly a change has occurred during the past three decades, and the earliest signs are now apparent that indicate "the dangers of our complicated technological world where institutions and ideologies so easily tend to take over man's individual verification of mortality and his personal commitment to humanity." Without attempting to pass judgment on any particular procedure one can simply state that some types of investigative work seem less shocking today than a few years ago to an increasing number of physicians. The individuals who have accepted this change possess new and unfamiliar characteristics. Perhaps the most significant

characteristic is the quality or state of freedom from intervention of past beliefs and "a loss of the sense of danger that threatens any man who repudiates either his own past or the past of his people."

In any discussion of medical problems the majority of comments are gross generalities. For each statement there are always exceptions. There are investigators who are excellent clinicians; practitioners who are capable of a very high order of research; and remarkable teachers in both groups. No two physicians practice alike, and it has been said that there are 83 different methods employed in the 83 medical schools with full-time teachers. Additional problems pertain to private hospitals and to physicians not affiliated with teaching hospitals, although it is the teaching hospital that sets the example. Nevertheless, the exceptions represent a small minority, and certain trends are apparent that require foresight and decision if the patient is to receive the best medical care. Occasionally, a few unusual physicians mask the basic weaknesses of a department and lull everyone into a false impression that all is well. The real goal of all teachers, namely, to convert average students into excellent physicians is not often realized today.

The correction of existing difficulties, as others have emphasized, depends on the restoration of clinical medicine to its proper place. This is not easily remedied. It requires initially the acceptance of the premise stated a few years ago by Means, a professor of Medicine at Harvard, that, ". . . for good medicine in every case, no matter under what circumstances medical service is being provided, some single physician must have final responsibility for the care of the patient . . . In other words some one doctor must be in command . . . Two or more heads may be better than one in arriving at a correct diagnosis, but one head has to make the decisions which lead to a course of action for the care of the patient." To meet this criterion the teaching hospitals must place in charge of each ward one physician (internist, pediatrician, surgeon, etc.) with a broad background of clinical medicine plus a working knowledge of the related subspecialties. All the various subspecialties will continue to require units "made up of full-time and part-time physicians, clinical investigators, and, in some instances basic scientists . . . dedicated to total competence within its designated area of interest" but always on the general ward—not special wards—and the patients must be under the care of the one clinician in charge. The subspecialists function as consultants, and the clinician in charge holds the reins. The latter needs more than knowledge. He requires judgment, enthusiasm for his work, "the power to make decisions and stick to them (at least when they are correct), and, most important, the strength to resist all the various and powerful forces that lead to deterioration."

To train physicians to assume this tremendous responsibility in view of the "torrential outpouring" of new facts is such a formidable task that some of the educational methods now employed must be revised. It is made more complex by the serious disadvantages of prolonged institutional training. One disadvantage described years ago by Janeway is worth repeating.<sup>14</sup> He emphasized that, "A mistake or omission on the part of any single member of the staff, is minimized or offset by some other member's diligence. This is the indispensable condition for training young physicians without jeopardizing the welfare of the patients. In

<sup>14</sup> T. C. Janeway, Outside Professional Engagements by Members of Professional Faculties. *J.A.M.A.*, 90:1315-18, 1928.

equal measure it becomes an obstacle in the training of the more mature. A sense of deep individual responsibility, so essential in making and keeping a good physician and which is assured by the acceptance of money for his services, is, therefore lacking for the upper members of a hospital staff." The appointment of a few clinicians to each department does not in itself solve the problem. Snapper has pointed out the necessity of a change in the attitude of many departments for, "As long as the upper echelon . . . looks down on empirical medicine, the students will accept this opinion. Young men are cruel critics, and, thus, the students will not refrain from demonstrating their disdain for physicians who feel that experience still plays an important role in the application of medicine at the bedside. In this hostile atmosphere the experienced clinicians will feel themselves unwelcome outsiders, and this will play havoc with their efficiency as teachers."<sup>15</sup> Conversely, many years of successful private practice plus an academic title does not per se accord the clinician the respect of the house staff and students—much more is required.

If the clinician who fills these requirements is a salaried full-time teacher, his value to the community is lessened. If he is engaged in private practice there is little time for hospital work. Again, there are exceptions but the solution of this complicated program will in all likelihood require a panel of part-time physicians who are so adequately compensated financially by the teaching hospitals, that they can afford to restrict the volume of their own private practice and thereby remove any conflict of interests. The compensation must be in the form of a salary and not in consultation work directly or indirectly supplied by the hospitals. It is important that their offices remain outside the hospital. Abuse of this plan may easily occur, and hence appointments are best made on a year-to-year basis, without tenure. These physicians should be free of any obligation to produce in research. They must retain a deep sense of individual responsibility in order to satisfy completely each patient's complaints, major and minor, as far as it is possible to do so, and, by example, begin once more the renascence of clinical medicine both in the hospitals and in the communities. Their opinions will be of the utmost importance in many departmental decisions and can be obtained without unnecessary committee appointments.

It will not be easy to find clinicians who possess this string of specifications. Nevertheless, these qualities characterized all the great clinical teachers of the past and will again develop in the combined environments of the hospital and outside practice. To the critics who believe that the day of the clinician in American medicine is over, Stokes has replied "I believe not, but it must be recognized that the task of the clinician is now more difficult than ever before in that he has to inform himself in many fields . . . disciplines to which he did not have to submit fifty years ago. This demands a good deal of him but, I believe the demands must continue to be made and accepted."

So many astute analyses, warnings, and suggestions have been made by renowned physicians and philosophers of science in an effort to improve patient care that their lack of success is a curious phenomenon. Incredible as it may seem it is due in a large measure to the inability of one group to communicate with another. Many doctors have now traveled so far down the fascinating road of research that, as Osler predicted, they can no longer truly comprehend "those wider in-

<sup>15</sup> I. Snapper, Research and the Teacher of Medicine. *J.A.M.A.*, 170:442-45, 1959.

terests to which a great hospital must minister." We are living in the middle of two cultures, and it is doubtful whether the gap between can be narrowed. This statement may be denied vigorously, but the proof is the failure to prevent and correct the existing difficulties which have so seriously disturbed the medical profession and the public. It seems likely that the trustees of the hospitals must abandon temporarily their role of non-interference in medical policies; straighten the situation; and promptly retire to their fiscal problems whilst keeping a watchful eye on future developments.

## Letters to the Editor

Is the presence of a medical school an unadulterated boon to the community in which it is located? Many active medical educators are apt to think so. There are good reasons for this attitude. In addition to the primary aims of medical education, there are many secondary benefits to the community. To some degree a better level of medical practice is stimulated, research is encouraged, training in paramedical fields is aided and community prestige is enhanced.

Yet it should be recognized that the medical school brings its own peculiar problems to the community. A considerable experience, including teaching responsibility at varied levels in ten different medical schools, has made this point evident to the writer. Sometimes internecine wars within the school spill over and affect the community. For example, in recent years a prominent university found it necessary to take paid advertisements in local newspapers to explain the official side of one such conflict, in which the chairmen of three major departments were summarily fired. Sometimes the conflicting interests of the school and the general body of physicians practicing in the community lead to a sort of "town-and-gown" strife.

Every medical school is accompanied by certain built-in sources of conflict, present in varying degree. Some of these may be summarized thus:

1. Internal tensions within the school are common. Medical education tends to attract somewhat restless, ambitious individuals. Each has his own needs and goals. Pursuit of these may result in stress. In any field there can be only one "king-of-the-mountain"—the department chairman. Beneath him, his associates are striving upward, and may not be satisfied with their academic, scientific, or financial status and progress. The chairman, himself, may be in conflict upwards, sideways, or downwards in the table of organization, attempting to achieve his own personal and professional goals. The restless movement of medical educators from one institution to another is symptomatic of this problem. While visiting a well known medical school last year, the writer saw in a single department three separate aggregations of expensive research equipment lying idle. These had been sloughed off like old snake skins by faculty members who had gone elsewhere. The chairman of this department has since moved also.

2. Medical educators usually have smaller incomes than physicians of equal intellectual qualifications in private practice. This adds to restlessness, since physicians have an easier escape to more lucrative means of livelihood than do most nonmedical educators.

3. Research may bring intellectual satisfaction, but it creates problems which may increase tension. These may include conflict over funds and facilities, comparisons as to accomplishment, and questions concerning research freedom.

4. Financial conflict of interest may arise between medical school and practicing physicians. In order to provide adequate incomes, may "full-time" faculty members practice? If so, to what extent will they be permitted to compete with practicing physicians? If the faculty member practices, will he keep the fees earned? Will his fees be turned in to a pool from which other medical educators (some of whom may not be physicians) may benefit? Is this consistent with

concepts of ethics held by the local county medical society? Variations on this theme have occasioned concern in three different medical schools and their communities in the writer's personal experience.

5. Most medical schools are partially dependent on nonuniversity-owned public or private hospitals for teaching facilities. How much control, then, shall the university exercise over the medical staffs of these hospitals, their appointments and their mode of practice? If the medical school is closely allied to the community's charity hospital, what financial and professional strains will each place upon the other? Variations on these themes have occasioned discussion in five different medical schools in the writer's personal observation.

6. The continuing trend toward full-time clinical departments has many praise-worthy features. Inevitably, however, practicing physicians who have played active roles in the medical school for many years find their status downgraded by each such move, with resultant tension.

Compared with the many benefits brought by the medical school to the community, these sources of dissension are usually minor. Some of them are inevitable, being manifestations of human nature. Many can be lessened by intelligence and understanding. They must be viewed in context and not magnified nor distorted. When the existence of these and other potential sources of conflict is recognized, steps can be taken to cope with or eliminate such problems. The path of medical education can then be considerably smoothed.

ALVAN G. FORAKER, M.D.  
*Jacksonville, Florida*

The three articles in the January, 1961, issue, concerning the relationships between the pharmaceutical manufacturers and physicians should be most helpful in arriving at an acceptable solution.

It is particularly important to make sure that we are talking about the same things. The representatives of the pharmaceutical industry have contradicted Dr. May's major thesis—that they are engaging in medical education or facsimile in order to sell their products. Therefore, it is vitally important to examine this question of fact. The pharmaceutical representatives state,

"There are some not associated with the industry who seem to confuse promotional efforts with educational efforts, whereas actually the members of the P.M.A. do not consider their advertising to be educational but merely informative."

The correctness of this statement can be judged by referring to the verbatim testimony before the Senate Subcommittee on Antitrust and Monopoly. In the hearings on Jan. 21, 1960, the president of a leading firm repeatedly referred to "educating" physicians and psychiatrists (page 8978, Part 16), and the following excerpts are particularly pertinent:

'Answer: "I think our expenditures on advertising are very reasonable. We have no particular inclination to throw away money on excessive advertising, because certainly there is a point of diminishing return. We have made extensive

studies of the best way to *educate* the physician, and we believe we have found the best formula. I believe that our percentage of promotion is probably lower than most other companies, because of this intensive study of how best to promote our products."

Question: "Still, especially with tranquilizers you had a real job of advertising, didn't you?"

Answer: "We had a colossal job of education; yes, sir."

Inasmuch as the witness was the immediate subordinate of one of the authors of the article in *The Journal of Medical Education*, these spokesmen can hardly disclaim knowledge or responsibility.

It may be added that the advertising claims of that particular company have been reliable—but they are advertising, not education.

Perhaps the representatives of the pharmaceutical industry mean that they intend to abandon their efforts to disguise advertising as education—a pastime which Joseph Wood Krutch has described as "an ecstasy of impudence." If so, a direct statement to that effect would be most welcome.

SOLOMON GARD, M.D.  
*The Albany Medical College*

## ABSTRACTS FROM THE WORLD OF MEDICAL EDUCATION

ANGELA SANCHEZ-BARBUDO, PH.D.

Abstract Editor

**Evaluación del Estado Actual de la Medicina Psicosomática** (An Evaluation of Psychosomatic Medicine at Present). RAMÓN DE LA FUENTE MUÑIZ, M.D. *Gaceta Médica de México*, T. XC, No. 2, pp. 113-124 (Feb.), 1960.

This is a survey of the different currents in psychosomatic medicine developing at present in various countries. In Germany, psychosomatic investigation has been inspired by the predominant currents in philosophy, phenomenology, and existentialism, deriving from both the principle of a "phenomenology of existence." Its primary objective is not so much to establish new techniques but rather to discern theoretical principles which may serve as a common base for the methods already applied. The continuous growth of psychosomatic medicine in Germany and its increasing influence in France and in the U.S. are interpreted as a reaction against the mechanism and biologism of the Freudian school. In the Soviet Union, on the other hand, the term "psychosomatic medicine" is almost unknown among medical scientists who prefer to speak of "cortical-visceral pathology," more in accordance with Soviet doctrine, since it is based on Pavlov's reflexology, offering the Russian physiologists methods of research as well as explanations of the phenomena. "Cortical-visceral pathology," it is pointed out, although representing a systematic effort to build up a doctrine and providing a definite basis

for the study of one aspect of psychosomatic medicine, does not help, however, to overcome Soviet scientists' inclination to discard any nonphysiologic concept and to restrict themselves to the study of the observable functions, eliminating the analysis of the deeper motivations. Actually it proves difficult to apply the concepts of "cortical-visceral pathology" to the complex life situations, and, as appears from Soviet clinical reports, Russian medical scientists are reduced to translate known psychologic mechanisms into the language of reflexology, since concepts such as "subconscious," "repression," "conflict," etc., are being rejected as "idealistic Psychologisms." Soviet clinicians recommend as best methods to interrupt the disturbed cortical-visceral reflexes and to re-establish sound ones, long sleeping cures, and surface psychotherapy. In the U.S.A. it would be difficult to single out as predominant any one school of psychosomatic theory. There exist today a great diversity of concepts and investigative methods. Mentioned among the principal representatives of the various currents of psychosomatic medicine are H. F. Dumbar (cf., *Emotions and Bodily Changes*, 1935, 4th ed. Columbia Press, 1954); Harold Wolff and his collaborators (known as the "Cornell Group"), and of the psychoanalytic school, Alexander; Grinker; Margolin; Kaufman; Deutsch; Kubie, etc. It is pointed out that the different currents complete rather than contradict one another. The elements

they have in common can be summed up as follows: (1) utilization of the biographic method which envisages illness not so much as an entity but rather as one moment in the life of the patient; (2) the dynamic point of view; (3) application of the Hegelian *dialectical* method as a conceptual instrument. The most notorious problem confronting psychosomatic research derives, the author believes, from the difficulty to determine quantitatively the emotional factors present in disease. Another controversial aspect of psychosomatic medicine, also discussed in this survey, is the problem of *selection* of the diseased organ.

**Humanismo, Pilar Básico de la Medicina**

**Contemporánea** (Humanism, A Fundamental Pillar of Medicine Today).

DR. CARLOS VILLANAR TALLEDO. *Gaceta Médica de México*, T. XC, No. 3, pp. 185-194 (March), 1960.

The topic chosen by Dr. Talledo for his inaugural address, as a new member, to the Academia Nacional de Medicina (Mexico) reflects an acute awareness, and concern over, the threat, today greater than ever, of a progressive de-humanization afflicting medicine as well as *médicos*. That there have been radical changes not only in medical methods and techniques but also in the fundamental *concepts* of medicine is a fact, he contends, too obvious for discussion. Not less true, but perhaps less evident, is the intricate relation between the innovations and renovations in the field of medicine, and the modifications in general culture which have taken place in our world. A brief survey of the history of medical art and science throughout the centuries, from the Hippocratic concepts to psychosomatic medicine, supports the thesis that all developments and changes which have occurred in the medical world have been the results of a con-

frontation with the structure and image of man established by the different philosophical currents in different periods of civilization. Such a historical flash-back serves also to strengthen the conviction that the exercise of the medical profession, more than of any other, must be firmly based on *humanism*, because its deepest roots and main purpose are to achieve the welfare of man. Dr. Talledo therefore laments the trend (observed today in his environment as well as around the world) which stimulates doctors to detach themselves and their medical practice from this final purpose. Humanism, defined as the desire to bring about the welfare of mankind, as much as the striving to acquire knowledge and participate in the highest activities of the human mind, must always remain the main pillar to support the capacities of the physician. The practice of medicine, especially in our time, requires much *knowledge*, but still more *wisdom*. In order to balance the extremes of specialization and technology which are now threatening to detach the physician and the medical science from their fundamental goal, the service to the patient, today's "new medicine" needs an orientation toward a "new humanism" (substituting the old, classic one), that is: participation in all higher values of culture and an active interest in everything related to man, as individual or as community. The latter aspect, as seen by Dr. Talledo, must also include the earnest concern with the achievement of social justice and fair opportunities for all people.

**Brain Research Centers in South America.** H. W. MAGOUN. *World Neurology*, Vol. 1, No. 3, pp. 217-223 (Sept.), 1960.

The International Congress of the Physiological Sciences, held in Buenos

Aires in August, 1959, offered an opportunity for several staff members of the University of California at Los Angeles to visit the facilities for brain research which have been established throughout South America. This paper is an account of collective impressions produced by these individual visits. The following institutions were visited: (1) the Venezuelan Institute for Scientific Research in Caracas (formerly the Venezuelan Institute for Neurology and Brain Research) which, since the last revolution, has considerably widened its scientific interests; (2) the Institute of Biophysics at the University of Rio de Janeiro, an outstanding laboratory for basic research in the biological sciences, with the focus of attention on problems of special interest for Brazil; (3) the School of Medicine of the University of São Paulo, Ribeirão Preto, Brazil, where leadership in brain research has been taken by the Department of Physiology; (4) The Institute for Investigation in the Biological Sciences, one of three outstanding centers for brain research in Montevideo, Uruguay; (5) the Faculty of Medical Sciences of the Universidad Nacional at Buenos Aires, Argentina, where brain research is centered in the Department of Physiology; (6) two centers in Chile (though not actually visited, a great deal of information about them was obtained from discussions with Chilean investigators attending the Congress): The Physiology Laboratory at the Catholic University of Chile, and the one located at Chile's Universidad Nacional; (7) Lima, Peru, where the medical personnel of the four branches of the Armed Forces (including the police) are planning to establish a series of research institutes; (8) Mexico's School of Medicine, Mexico City, located on the main campus of the Universidad Nacional, where the Department of Physiology is making outstanding contributions in the field of neurology.

Three other neurologic research laboratories have been established in Mexico City, namely: The Institute of Biological and Medical Studies, at the Universidad Nacional; a neurologic research laboratory located in the National Polytechnic School, and the Laboratory of Physiology of the National Institute of Cardiology (the latter is doing excellent work in the general physiology of neuro-muscular transmission). All the visitors were greatly impressed by the splendid developments, made in these centers, by excellently trained (often in the U.S.), gifted, dedicated and hard-working scientists. Everywhere they found among the young people an extraordinary interest in research careers and great capabilities for accomplishment in the field of neurology. In general, the handicaps to research in South American countries seemed primarily to be of financial nature. As Dr. Magoun (Department of Anatomy, California School of Medicine, at Los Angeles) points out, encouragement of the South American efforts in biomedical research, and closer cooperation are most desirable and could well become an effective factor in the development of more cordial relations between the U.S. and the Latin American countries.

**Folk-Lore as a Medical Problem among Arab Refugees.** ALICK CAMERON, M.D. *The Practitioner*, Vol. 185, No. 1107, pp. 347-353 (Sept.), 1960.

This is a report on folk medicine and superstitious practice observed by Dr. Cameron in 1949/50 when, under the British Red Cross Relief Commission, he was entrusted with the medical care of an Arab refugee camp in Jordan. There he found the already complex health problems still further complicated by the intrusion in the medical sphere of deep-rooted superstitions, such as the

belief in the "Evil Eye" and the machinations of strange beings, thought to be of pre-Adamite origin, the "Djinn." (The latter are said to inhabit the Jabel-Kaf, which in the Arab cosmology is the range of mountains that surrounds the earth.) Such matters, it is pointed out, cannot be dismissed lightly if one wants to retain the confidence of the people, whose life and welfare may sometimes depend on medical attitudes rather than on the purely technical side of medicine. The roots of those beliefs, and the superstitious practice based on them, can be traced back, in all races and societies, to the beginnings of recorded time (written reference to the malignant effects of the "Evil Eye," for instance, has been found in the excavations of the Sumerian civilization in the Tigris-Euphrates Valley). Some methods of prevention and therapy of the afflictions believed to be caused by those powers are discussed in detail. The principal therapeutic methods applied, for thousands of years, by local Arab practitioners for the treatment of a variety of diseases are the following: *cautery*; *scarification*; *cupping* (dry cupping is usually carried out by heating the air in a small jar and applying its mouth to the patient's skin to produce suction; combined with *scarification*, which produces bleeding, it is known as *wet cupping*); *tattooing*, binding with wires and threads, etc. Protective measures consist mainly in the hanging around various parts of the body of all sorts of *amulets* (human cervical vertebrae, thought to be the most effective ones, are sometimes worn round the neck by people with persistent cough). Among the medicaments applied externally, one finds bread, camel dung, eggs, henna (painted over the forehead, especially against fever); red peppers; urine (especially for wounds); coffee grounds (for burns); the juice squeezed from crushed scorpions (against scorpion

bite), etc. Internal medicines do not appear to be widely used, except sage "tea" for certain digestive upsets, eye drops of many varieties, and *mummia*, a powder made from mummified human remains (the most potent is held to be that from the bodies of pilgrims who died on the road to Mecca). In some of these practices the operations of Frazer's laws of magic, as well as the law of similarity (or homeopathy) and the law of contiguity in which primitive people believe, can be discerned. When viewed as a whole, those quaint beliefs form a qualitative approach to social medicine which cannot be ignored because it may lead to a deeper understanding of man. It is with a plea for a "philosophy of scientific humanism" in the medical care of primitive people that Dr. Cameron concludes his report.

**The Bangkok Project, Step One.** ERNEST E. BOESCH, PH.D. *Vita Humana*, Vol. 3, No. 2/3, pp. 123-140, 1960.

Frequently our patterns of judging do not seem to apply to the behavior of non-Western human beings. This suggests that our psychological knowledge is not entirely based on "human universals"; that it is, to some extent, a specific product of our Western culture, valid only as far as it remains within its own limits. It is a fundamental challenge to modern psychology to face the problem of the variability of human nature in relation to different environment conditions. After having emphasized strongly the importance of cross-cultural psychology for personality theory and applied psychology, the author (Director of the Institute for Psychology, University of the Saar, Saarbrücken) describes the main aspects of the "International Institute for Child Study" in Bangkok, which was founded in 1955, after 2 years of planning and preparation, by the joint efforts

of UNESCO and the Thai government. The Institute has been devoting itself to three main purposes: (1) to gather data about the development and educational status of Thai children; (2) to train, and to promote cooperation within, an "intercultural" team of research workers in Bangkok; and (3) to organize a system of international cooperation for obtaining comparable parallel data from different cultures. During the years 1956-58 Dr. Boesch directed the first part of its research program, and has outlined here the principal features of this so-called "Step One of the Bangkok Project," discussing also, on the basis of a survey of the thus-far available results, the methods, principles, and problems of cross-cultural psychologic research. The following are, roughly summarized, the conclusions, useful for further work, which can be drawn from "Step One": (1) Personality development of children in different cultures is not simply parallel, but shows areas of retardation and acceleration according to the cultural mould. (2) These differences are due (hypothetically) to the variations in universal growth processes through cultural selection and specialization. (3) The whole question of differences in fundamental ability must, therefore, give way first to the question of differences in the building up of motivations and "frames of reference." (4) The program of cross-cultural research centers on four main problem areas: (a) description of adult-matrices, (b) types of influence on the growing-up (pressures, incentives, examples, etc.), (c) universals of growth processes, and (d) cultural variations of the latter. The work begun at Bangkok is at present going on in a double way: in Bangkok itself, where, after the first survey study, special problems are under investigation, and at the University of the Saar, through further analysis of the present

data, the collection of additional ones, and through methodological and conceptual studies of the fundamental problems of cross-cultural research in psychology.

**Medical Education in India.** RAJKUMARI

AMRIT KAUR. Postgraduate Medical Journal, Vol. 36, No. 420, pp. 592-597 (Oct.), 1960.

Drawing from a life-long experience as a social worker and 10 years of office as India's Minister for Health, the author presents a survey of the achievements in the field of medical education in his country and also assesses the trend of progress for the future. Discussing the expanding role of medicine and the question of the selection for medical education, emphasis is put on India's special needs. Although India, undoubtedly, will do her share in the task of advancing medical science and of promoting better health and working conditions for all mankind, there are today certain urgent needs in that nation which differ from those of the more developed countries, and her national program of education must make provision to meet those needs (undergraduate training, for instance, must be strongly oriented toward preventive medicine). India's greatest problem at present in the field of medical education and public health is of *quantity versus quality*. The number of medical colleges in India has grown at a rapid rate: within a period of less than 14 years their number has increased from 17 to 52. This expansion has been in response to the increasing demand for medical education (even at present the number of applicants to medical schools is 3 or 4 times greater than the total number of vacancies available). However, the increase in the number of medical colleges has been accompanied by grave dangers with regard to the

essential standards of training, due to a variety of causes: inadequate preparation of the entrants; insufficient training facilities and equipment, shortage of teaching staff, etc. Yet in spite of these and other difficulties a fair amount of progress has been made, since India's independence, in reducing the ill-effects of such an expansion. It is suggested that an unbiased and independent assessment of the achievements, and, still more important, of the deficiencies of Indian medical education should be made and be taken up by the Health Survey and Planning Committee which has been established recently by India's Central Government.

**The Basic Sciences of Neurologic Medicine Reconsidered.** SIR FRANCIS M. R. WALSHE. *World Neurology*, Vol. 1, No. 3, pp. 189-195 (Sept.), 1960.

Traditionally, anatomy and the physiology of the nervous system have long been considered the two basic sciences for neurology. It now appears that this concept needs a revision. If it is true that neurology and neuropathology's primary responsibilities are the study of etiology and the pathology of nervous disorders, in order to prevent or to cure, we must ask ourselves to what extent our two basic sciences, in their present form, are apt to carry out these functions? Physiology may be defined as the study of all the dynamic properties of the nervous system, including the comprehension and rational formulation of all its capacities. Neuroanatomy, likewise, must take into account all morphologic elements of the nervous system, the neural as well as the non-neural ones. Both disciplines must unite their efforts and take into consideration the evolutionary history of the human nervous system. So far, however, we do not have a neurophysiology which fulfills the demands

of this definition. The present neurophysiological viewpoint has created—or perhaps itself has originated from—some restricted and very selective interests: it has penetrated deeply into certain aspects of the nervous dynamism, while others have been by-passed. Today's neurophysiology is an abstract from the total activities of the nervous system which practically ignores the non-neural elements. Yet many disabling and progressive diseases of the nervous system affect the glia first and the neuron only secondarily, and even when disease is primary in the nerve cell, secondary glial reactions may add seriously to the destruction of the neuron. For the clinical neurologist axonology and synaptology are not enough: neurophysiology must be balanced and comprehensive before it can be considered a basic science adequate to its needs and responsibilities. It is to be regretted that "classic" or academic neurophysiology has not yet provided this, and, as far as the author can discern, that it is not moving in that direction either. The conclusion is that "neurophysiology is at present an off-balance discipline." Comparative anatomy, on the other hand, seems to exert little or no influence on current neurophysiologic thinking. While nobody can deny the neuroanatomist and neurophysiologist the right to pursue their own aims of scientific research, the problems of today's neurology, by crossing the frontiers of several scientific disciplines, call urgently for collaboration between workers in different aspects of science. None of neurology's problems can be carried to a complete solution today without scientific analysis by every relevant means. Today's clinical training, "with a smattering of morbid anatomy, clinical pathology, empirical electro-encephalography, and textbook-psychiatry," the author

warns, can no longer be considered a truly scientific preparation for research into the basic problems of nervous disease. Now is the time to re-appraise neurology's research responsibilities and to envisage the training of a new kind of experimental neuropathologist who, in

collaboration with physiologists, embryologists, biochemists and immunologists, will be able first to tackle the basic research in physiology that has been neglected up to now, and then attempt to build a scientific knowledge of the etiology and nature of disease processes.

## NEW BOOKS

KENNETH E. PENROD  
Book Review Editor

### Abstracts

**Respiration. Physiologic Principles and Their Clinical Applications.** By P. H. ROSSIER, A. A. BUELMANN, and K. WIESINGER. Edited and translated from the German by PETER C. LUCHSINGER and KENNETH M. MOSER. St. Louis: The C. V. Mosby Company, 1960. 494 pp. \$15.75.

This is the first English edition of this book. The first German edition appeared in 1955 and was followed by a second edition in 1958. The original authors were at the University of Zurich. The translation has brought with it a rather extensive revision and rewriting throughout the book in keeping with the goals of making all sections understandable and readable to the American audience. The principle theme is that of pulmonary pathophysiology. For this purpose the authors define pathophysiology as the functional adaptation to unusual conditions and sickness. The authors consider that the time factor has great importance and that this leads to functional conditions which can be studied only in the sick human. Thus many of the studies reported herein are made on patients. Much material on the normal physiology of respiration is included as a point of departure for the pathophysiology described.

**Dermatology. Diagnosis and Treatment.** By MARION B. SULZBERGER, JACK WOLF, VICTOR H. WITTEN, and ALFRED W. KOPP. 5th ed. Chicago: The Year Book Publishers, Inc., 1961. 598 pp. \$14.00.

The first edition of this textbook appeared under the title "Dermatologic Therapy in General Practice." This book is written primarily for medical students and physicians as a truly practical, modern, and relatively short textbook on the recognition

and management of common skin diseases. This edition has undergone extensive, and in many places complete revision and rewriting. Some entirely new sections are included, such as a new chapter on "Antibiotics; Sulfonamides; Corticosteroids and Adrenocorticotropin." Also, there is a new section on "Otitis Externa." This book is aimed directly at the precise forms and manner of use, the exact effects and results to be expected, the important instructions to patients, and the pitfalls and the contraindications for each medicament and procedure. It is conceived as a handbook on therapy.

**The American Academy of Orthopaedic Surgeons Instructional Course Lectures, Vol. 17.** 1960. Edited by FRED C. REYNOLDS. St. Louis: The C. V. Mosby Company, 1960. 406 pp. \$18.50.

The 1960 Instructional Course Program of the American Academy of Orthopaedic Surgeons consisted of 111 separate courses. Eighty-four of these were repeated from the previous year, and 27 were new. A portion of these new courses are included in this volume. The five parts making up the present volume are as follows: (1) Fractures, (2) Bone Graft Surgery, (3) Children's Orthopaedics, (4) Miscellaneous, and (5) Athletic Injuries.

**The Central Nervous System and Behavior. Transactions of the Third Josiah Macy Jr. Foundation Conference, February 21-24, 1960.** Edited by MARY A. B. BRAZIER. New York: The Josiah Macy Jr. Foundation and the National Science Foundation, 1960. 461 pp. \$7.50.

This conference, held at Princeton, New Jersey, was attended by 26 participants. The titles of the formal papers were: The Evolution of Man's Brain, Biochemical Ma-

turation of the Central Nervous System, Neuronal Models and the Orienting Reflex, Concepts of Drive, Affectional Behavior in the Infant Monkey, Verbal Regulation of Behavior, and Signaling Systems in the Development of Cognitive Functions. In connection with this conference, English translations of 70 Russian articles were made. Copies of these translations have been distributed to libraries of all medical schools in the United States and Canada in a volume carrying the same title, compiled by the U.S. Department of H.E.W.

**Light Coagulation.** By GERD MEYER-SCHWICKERATH. Translated by STEPHEN M. DRANCE. St. Louis: The C. V. Mosby Company, 1960. 111 pp. \$9.50.

The first light coagulation in human beings was successfully carried out in the spring of 1949 after 3 years of experimental work. By 1959 a considerable number of patients were being thus treated. The German edition of this book appeared a year ago and was written primarily with the hope of making it easier for those who are using the instrument which is now on the market and also for those physicians who refer patients for light coagulation. This new method is not a panacea for all ophthalmological ills but has to be applied with wisdom and judgment and in combination with the other available methods of treatment. Since this new technique is finding considerable application in this country, an English edition of this book is timely.

**Importance of the Vitreous Body in Retina Surgery with Special Emphasis on Re-operations.** Second Conference of the Retina Foundation, May 30 and 31, 1958. Edited by CHARLES L. SCHEPENS. St. Louis: The C. V. Mosby Company, 1960. 223 pp. 130 figures. \$15.00.

The aim of the second conference of the Retina Foundation was to arrive at a better understanding of the problems involved in patients with retinal detachment of poor prognosis. An effort was made to invite

investigators and clinicians whose work and interest were likely to shed light on the problem. There were 40 participants at the conference, ten of whom were official speakers. Their papers, together with discussions, are included in this book.

**Manual of Care for the Disabled Patient.**

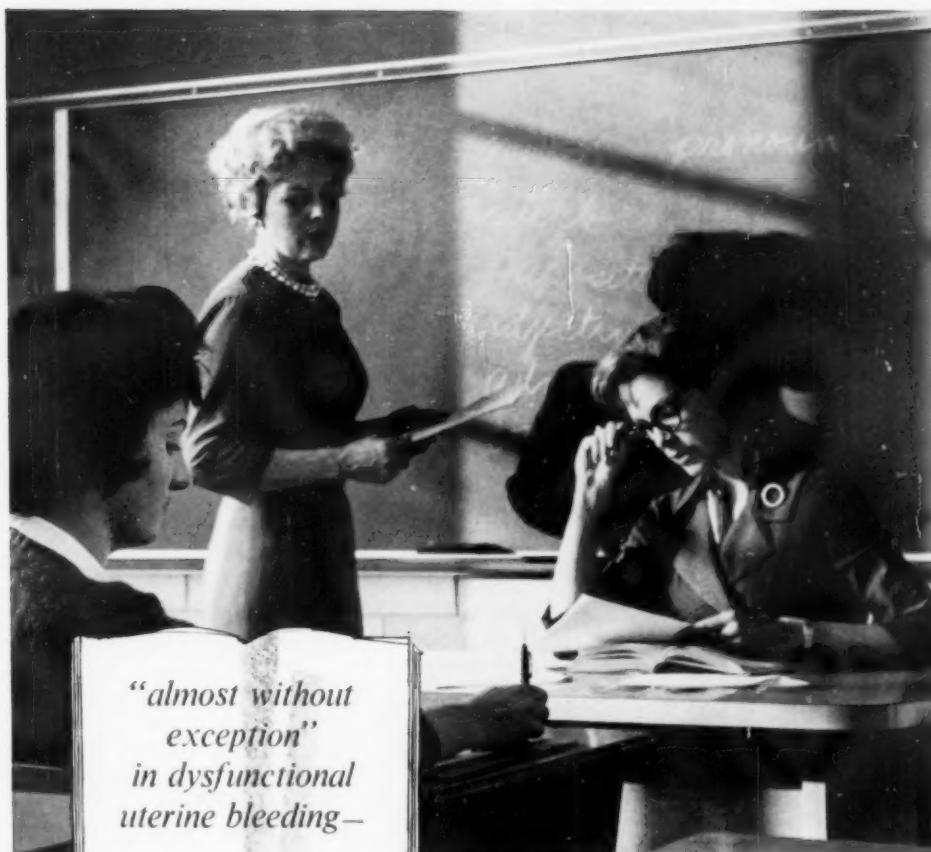
By ARTHUR J. HEATHER. New York: The Macmillan Company, 1960. 107 pp. \$3.75.

The aim of this manual is to point out the importance of simple treatment regimens which, if instituted early in the patient's illness, will lower morbidity by avoiding complications common to the severely disabled patient. Once the staff is made aware of the problems and has become familiar with their prevention, reduced hospitalization and speeded rehabilitation result. The material in this book is limited in order to focus on effective preventive and therapeutic measures to combat complications. Nutrition, prevention and treatment of decubitus ulcers and urinary tract complications, and the avoidance of crippling muscle contractures and joint ankyloses are some of the topics discussed.

**Progress in Clinical Psychology. Vol. IV.**

Edited by LAWRENCE E. ABT and BERNARD F. RIESS. New York: Grune and Stratton, 1960. 178 pp. \$6.75.

Like earlier volumes in this series, this volume seeks to bring up to date—covering 1958 and 1959—developments in clinical psychology that represent progress in the movement of the field in the direction of a genuine science of the application of the clinical method to psychology. Again, like earlier volumes, this book represents an organization of the field around topical issues rather than in terms of the more usual categories of research foundations, diagnosis, and psychotherapy. As in earlier books in this series, each contributor has been requested to be constructively critical of his material and cover his material in relation to older trends so that a somewhat systematic point of view might be developed.



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1. Southam, A. L.: Dysfunctional Uterine Bleeding in Adolescence, *Clin. Obst. & Gynec.*, 3:241 (March) 1960.

## MEDICAL EDUCATION NEWS

### from the Medical Schools

#### Mississippi Names New Director and Dean

Dr. ROBERT Q. MARSTON has been appointed director of The University of Mississippi Medical Center and dean of the medical school, effective July 1, 1961.

University Chancellor J. D. Williams announced selection of the 38-year-old Virginian for the top Medical Center Post following recent approval of the Board of Trustees of the Institutions of Higher Learning.

Dr. Marston succeeds Dr. D. S. PANKRATZ, who resigned February 15 in anticipation of mandatory retirement.

The new director comes to Mississippi from the Medical College of Virginia where he has been assistant dean and an associate professor of medicine. Dr. Marston's career includes two years as a Rhodes Scholar and five as a Markle Scholar.

A graduate of the Virginia Military Institute in 1943, Dr. Marston received his M.D. from the Medical College of Virginia in 1947. He earned his B.Sc. at Oxford during two years as a Rhodes Scholar.



Dr. Robert Q. Marston

His Markle Scholarship covered five years during which he taught at the Medical College of Virginia and the University of Minnesota. He is the author of numerous published papers on antibiotics, irradiation and viruses.

#### Cincinnati

Dr. STANLEY E. DORST, dean of the college of medicine, has announced the establishment of a department of gynecology, with Dr. LESTER J. BOSSERT as director. Gynecology formerly was a division of the school's department of surgery. The new department instructs students from the college of medicine and college of nursing and health. With the department of obstetrics, it offers a combined residency training program lasting

four years for physicians preparing to specialize in obstetrics and gynecology.

Dr. Bossert, a 1933 graduate of the Cincinnati medical college, is also director of the gynecological services in the hospitals affiliated with the University of Cincinnati Medical Center.

#### Columbia

Dr. JOSEPH CARY TURNER, professor of medicine at the College of Physicians and Surgeons, died March 2. Dr. Turner

# Why a new Pharmacology textbook?

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in other courses, this new book concentrates on the actual mechanism of the disease and the reaction of the drug on the specific tissue, organ, or system of the body which is the essence of real pharmacologic knowledge for the modern practitioner of medicine.

While many other pharmacology textbooks still attempt the impossible task of giving more and more definitive medicine and treatment, amassing encyclopedic listings of available preparations of practically all drugs, this new book stresses principles and essential facts about important drugs. Great saving of reading time is effected by eliminating repetitious discussions of compounds which have little practical or theoretical importance. Principles of absorption, excretion, distribution, drug metabolism and detoxication processes, toxicity and drug hypersensitivity are discussed in detail including many current concepts not yet available in most other volumes. Aren't these good reasons why you should carefully consider using Dr. Goth's new textbook for your pharmacology course next semester?

By ANDRES GOTH, M.D., Professor of Pharmacology and Chairman of the Department, The University of Texas Southwestern Medical School, Dallas, Texas. Ready in May. Approx. 584 pages, 6 $\frac{1}{4}$ "x9 $\frac{1}{4}$ ". 49 Illustrations.

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was attending physician in medicine at Presbyterian Hospital of the Columbia-Presbyterian Medical Center. He was a specialist in hematology.

### Creighton

Appointment of two new department heads has been announced by the school's dean, Dr. RICHARD L. EGAN.

They are Dr. I. C. WELLS, professor and chairman of the department of biochemistry and Dr. RICHARD S. GREENBERG, assistant professor and chairman of the department of ophthalmology.

Dr. Wells comes to Creighton from the State University of New York Upstate Medical Center. He joined the faculty there in 1950 and attained the rank of associate professor of biochemistry.

Dr. Greenberg has been an instructor in the Creighton medical faculty since September, 1956.

### Duke

The Duke University Medical Center's pathology department has begun an extensive new program of development, according to Dr. BARNES WOODHALL, dean of the medical school.

Half a million dollars will be spent this year on renovation of existing facilities, purchase of research equipment, and support of scientific investigations by faculty members. The bulk of this amount will come from grants awarded by the National Institutes of Health.

A doubling of the number of senior faculty members in pathology will bring the total to 12 by next summer.

### Albert Einstein

A grant of \$350,000 has been made to the college of medicine for the establishment of a "Therapeutic Community in Rehabilitation Medicine." The entire program will be under the direction of Dr. ARTHUR ABRAMSON and Dr. BERNARD

KUTNER. The award was made to the college by the Office of Vocational Rehabilitation.

According to university officials, the pioneer study is expected to reduce hospital stays, better prepare the patient for life outside the hospital and reduce the cost of rehabilitation in terms of time, money, and professional attention. A 37-bed ward in Jacobi Hospital, one of the teaching hospitals of the medical school, will be used for this study. Comparison will be made with conventional methods of therapy in a "sister" ward.

Dr. CARL LEVENSON has been appointed director of the department of physical medicine and rehabilitation of the Einstein Medical Center. Simultaneously, Dr. Levenson has been appointed medical director of Moss Rehabilitation Hospital, Philadelphia. The dual appointments were effective February 1. Dr. Levenson has been a senior clinical fellow in the department of physical medicine at the University of Pennsylvania.

### George Washington

Dr. H. GEORGE MANDEL, professor of pharmacology, has been appointed chairman of the department of pharmacology, succeeding the late Dr. PAUL K. SMITH, who headed the department for 15 years until his death in late 1960.

Dr. CLAYTON B. ETHRIDGE, professor of medicine, has been appointed director of postgraduate medical education. Dr. Ethridge has been a member of the medical faculty since 1937.

Dr. JANET TRAVELL, personal physician to President John F. Kennedy, has joined the George Washington faculty of medicine as associate clinical professor of medicine.

### Harvard

Dr. HAROLD F. SCHUKNECHT has been appointed the sixth Walter A. Lecompte

professor of otology and professor of laryngology at Harvard, and chief of otolaryngology at the Massachusetts Eye and Ear Infirmary. The appointments become effective July 1, 1961.

Since 1953, Dr. Schuknecht has served as associate surgeon and director of the otological research laboratory at the Henry Ford Hospital in Detroit.

At Harvard, and at the Massachusetts Eye and Ear Infirmary, Dr. Schuknecht will succeed Dr. LEROY A. SCHALL, who, in 1960, became Lecompte professor of otology and professor of laryngology, emeritus.

Dr. PHILIP E. MELTZER has been named clinical professor of otology. He is currently serving as acting head of the department of otology and laryngology at Harvard, and as interim chief of otolaryngology at the Massachusetts Eye and Ear Infirmary.

## Illinois

Dr. JOSEPH S. BEGANDO has been named vice-president in charge of the professional colleges. He has been acting vice-president since Dr. HERBERT E. LONGENECKER resigned last June to become president of Tulane University. Dr. Begando has been associated with the university since 1953, serving as assistant dean of the college of pharmacy, associate professor of pharmacy administration, and assistant to the president.

DR. S. HOWARD ARMSTRONG, professor of medicine at the University of Illinois College of Medicine and director of biological sciences and medical education at Cook County Hospital, died March 12. Dr. Armstrong's contributions to medicine included activities in graduate medical and psychiatric education, education in protein metabolism and kidney diseases, and participation in basic studies at the start of World War II in the use of plasma on the battle field.

He taught at Peter Bent Brigham hos-

pital, Boston, Boston City Hospital, Massachusetts Institute of Technology, and Harvard Medical School.

## Indiana

Dr. ARTHUR D. MERRITT recently joined the Indiana faculty of medicine as associate professor of medicine. Dr. Merritt has been a member of the faculty at George Washington medical school and chief of the medical investigations section of the National Institute of Dental Research.

## Johns Hopkins

Dr. GILBERT H. MUDGE has been appointed associate dean of the school of medicine. He will be in charge of directing and developing the school's post-doctoral programs. In addition, Dr. Mudge will continue to serve as professor and chairman of the department of pharmacology and experimental therapeutics.

Dr. Mudge joined the medical faculty at Johns Hopkins after nine years on the faculty of the College of Physicians and Surgeons of Columbia University.

## Kentucky

A new member of the medical school faculty is Dr. BEN EISEMAN, former professor of surgery at the University of Colorado School of Medicine. Dr. Eisman was named professor of surgery at Kentucky.

## Louisville

Construction is now under way on Louisville's \$2,730,000 medical-dental research building, with completion expected in about 18 months, according to WILLIAM McGLOTHLIN, vice-president of the university. The new building will house research facilities now centered in the medical school and the Louisville General Hospital.

### **Miami**

Dean HOMER F. MARSH, who has been with the University of Miami School of Medicine since its inception in 1952, will leave on June 30 to assume the vice-presidency of the University of Tennessee, in charge of the medical unit.

In his new post Dr. Marsh will have charge of the university's six schools in the medical field. He will have under his supervision the schools of medicine, dentistry, pharmacy, nursing and biological sciences and a graduate school. These medical units are located in Memphis, while the rest of the university is in Knoxville.

Dr. Marsh came to Miami in 1952 from the University of Oklahoma Medical School, where he was professor of microbiology and associate dean.

### **Michigan**

The University of Michigan Medical School has adopted a 12-month schedule for junior medical students, and modified the curriculum for juniors and seniors. Dean WILLIAM N. HUBBARD, Jr., said the action by the faculty places greater emphasis on developing the future doctor's responsibility to his patients.

Immediately following his sophomore year, the student will begin serving as an active member of a health team under the close supervision of faculty physicians. His clinical instruction will be oriented about the welfare of the individual patient, and formal lectures will be reduced to one hour a day.

Under the revised curriculum, scheduled to take effect June 12, 1961, the traditional vacation period following the sophomore year will be postponed until the senior year in order to speed the student into the clinical phase of his education.

### **Missouri**

The new five-floor research addition to the University of Missouri Medical Center is now being opened for use by the clinical research faculty of the school of medicine. Construction of the addition, which is an integral part of the Teaching Hospital, was completed this month.

The research addition provides the clinical departments with some 25 additional laboratories, eight office-laboratories, 15 offices and storage rooms, two conference rooms, and other accessory space.

### **New York Medical**

A program of graduate study in nursing to focus exclusively on clinical practice of medical-surgical nursing rather than administration or teaching will be inaugurated by the New York Medical College Graduate School of Nursing on September 5, 1961. According to Dr. RALPH E. SNYDER, president and dean of the college, this program is designed to provide a channel of professional advancement which will keep the nurse at the bedside, where she can render a unique and invaluable service to better patient care. He said the program is intended to meet the growing need for highly skilled nurse clinicians in specialized fields which are receiving increasing attention in modern medicine. "It will be on a level to qualify the nurse to serve as a partner of the physician and a full member of the professional health team," he said.

### **Ohio State**

The Ohio State University Health Center has put into service its new \$1 million radiation therapy facility for the treatment of cancer and allied diseases. The facility is housed in a two-story structure connected to a wing of University Hospital, with a one and one-half

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REFERENCES: 1. DeCourcey, J. L., and DeCourcey, C. B.: *Pheochromocytoma and the General Practitioner*, DeCourcey Clinic, Cincinnati, Ohio, 1952, p. 107. 2. Emlet, J. R., Crimson, K. S., Bell, D. M., and Orgain, E. S.: *J.A.M.A.* 146:1385 (Aug. 11) 1951.

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story betatron addition. According to university officials, the structure and equipment installations were designed and developed over the last six years to provide a completely modern treatment center. It is expected that training programs for radiation physicists and radiation therapists will be developed in the near future.

#### Oklahoma

The University of Oklahoma Medical Center recently bared its outlined details for a 10-year multi-million dollar plan that would give the institution a modern teaching hospital and additional land. Financing would require \$15 million in state funds during the period from 1961 to 1971, and center officials expect matching funds from the federal government, making the total for the project about \$30 million.

The proposed new hospital would connect University and Children's hospitals, the two state-owned hospitals at the medical center. A center spokesman said they are considered outmoded and inadequate for training physicians for the increasingly complex practice of medicine. Other projects call for housing for medical students, postgraduate facilities for the continuing education of practicing physicians, modernization of existing structures and expansion of outpatient facilities.

#### Seton Hall

Dr. ARTHUR J. LEWIS has been named assistant dean of the Seton Hall College of Medicine.

The newly appointed assistant dean joined the faculty of the Seton Hall college of medicine in 1959 as assistant professor of clinical medicine. In May 1960, he took a leave of absence to join the medical department of Wyeth Laboratories, Philadelphia, from which post he returns to Seton Hall.

Lewis received his M.D. degree from New York University School of Medicine in 1948 and was a member of that faculty from 1955 to 1959.

#### Stanford

Dr. FRANK MORRELL has been appointed professor of medicine and head of the division of neurology at the school of medicine. Dr. Morrell is former associate professor of neurology and neurophysiology at the University of Minnesota. In addition to holding the faculty post at Stanford, he is executive of the division of neurology for Palo Alto-Stanford Hospital Center.

#### U. of Texas (Galveston)

Dr. BENEDICT E. ABREU, associate director of research for the Pitman-Moore Company, has been appointed professor and chairman of the department of pharmacology of the University of Texas Medical Branch.

A lifetime interest in pharmacologic research has marked the career of Dr. Abreu. He has been the author, or co-author of more than 100 scientific published papers, and his recent and current interests have been centered around studies of the pharmacologic aspects of anesthesia, high and low blood pressure problems, and diseases of the cardiovascular and nervous systems.

Dr. Abreu has held teaching positions at West Virginia University School of Medicine, the University of Oklahoma School of Medicine, University of Georgia School of Medicine, and the University of California Medical School.

#### Vermont

Dr. GEORGE A. WOLF, JR., dean of the College of Medicine, has been appointed executive director of the Tufts-New England Medical Center and vice-president for medical affairs at Tufts University.

His appointment becomes effective next September 1.

Dr. Wolf will assume responsibility for the over-all activities of the New England Medical Center, which includes the Boston Dispensary and Rehabilitation Institute, the Boston Floating Hospital for Infants and Children, the Pratt Clinic, and Tufts University Schools of Medicine and Dental Medicine.

### **Yale**

The school of medicine dedicated its new Mary S. Harkness Memorial Auditorium March 17. The 449-seat auditorium, constructed at a cost of \$591,000, will be used for assemblies, lectures, demonstrations, and conferences — not only for local doctors and students but also for regional and national meetings. Its interior has been designed to meet special acoustical requirements of medical meetings and has closed-circuit television conduits connecting it with other parts of the Yale-New Haven Medical Center.

Dr. ROBCLIFF V. JONES, JR., assistant professor of clinical medicine, has been appointed director of the department of physical medicine and rehabilitation at Grace-New Haven Community Hospital. He succeeds Dr. THOMAS F. HINES who recently became director of rehabilitation services at Gaylord Hospital and Sanatorium in Wallingford, Conn. Dr. Jones has been a member of the Yale faculty since 1955.

### **Correction**

In our February issue, it was stated that Albany Medical College was the *third* medical school to grant departmental status to its division of postgraduate medicine, along with Michigan and Utah.

### **Western Ontario**

Dr. O. H. WARWICK, currently assistant professor of medicine at the University of Toronto, will become dean of the faculty of medicine at Western Ontario upon the retirement of Dr. J. B. COLLIP on June 30.

For the past three years Dr. Warwick has been deputy director and senior physician of the Ontario Cancer Institute and Princess Margaret Hospital in Toronto.

Dr. Warwick began his teaching career at McGill University where he earned his M.D. degree. After a year at McGill, he moved to Toronto to become medical director of the newly-formed National Cancer Institute of Canada, a position he held for seven years. He is co-author of some 30 scientific papers, and during World War II, Dr. Warwick made special studies of problems associated with high altitude flying. Since then his main interests have been in the development and testing of new chemical agents for the treatment of cancer, and in metabolic disturbances associated with malignant disease.

Dr. Collip, who is retiring after heading the faculty of medicine for the past 14 years, has won international recognition for his scientific achievements. He will continue at the university as professor of medical research and head of the Collip Medical Research Laboratory.

Subsequently, it has been drawn to our attention that the University of Kansas School of Medicine has an active and productive department of postgraduate medical education, which was established in 1945.

## from the National Institutes of Health

### Four Universities Set Up Overseas Medical Research Centers With NIH Grants

International centers for medical research in cooperation with foreign medical institutions are being established by four U.S. universities with funds supplied by Public Health Service grants awarded through the National Institutes of Health. The awards to the University of California, Tulane University, Johns Hopkins University and the University of Maryland, have been made in consonance with the provisions of Public Law 86-610 passed by Congress last year, appropriating \$5 million to initiate a program to "advance international status of the health sciences through cooperative enterprises."

The proposed plans for the international centers, to be located in Malaya, India, Pakistan, and Colombia, in addition to the primary research objectives, would provide for training medical personnel in the United States and overseas. The initial grants totalling \$1.4 million are for a four-year period. Continuing support will be provided for five-year periods subsequent to site inspections and recommendations to be made by members of a Committee on International Centers established by NIH.

The U. S. universities and their overseas affiliates, together with their initial research program plans are: The University of California (Berkeley) and the University of Malaya, with the Institute of Medical Research at Kuala Lumpur (studies of mycotic diseases); Tulane University (New Orleans) and Universidad del Valle, Cali, Colombia (studies of tuberculosis); Johns Hopkins University (Baltimore) and All-India Insti-

tute of Hygiene, Calcutta, India (hematologic and nutritional studies); and the University of Maryland (Baltimore) and Field Unit, Rawalpindi, Pakistan (studies of enteric disorders).

It is anticipated that the new research centers will provide the framework for the development of additional collaborative projects.

### Transfer Funds to Speed Construction of Research Facilities

The President's plans to stimulate the U.S. economy by encouraging construction activity will be supported by NIH's Health Research Facilities Branch, which is asking institutions that have received facilities grants but are unable to begin construction by July 1, 1961, to turn back their grant funds temporarily. The money will then be used to finance grants which have been approved but not paid because of lack of sufficient funds in the current fiscal year, all of which had been committed as of December, 1960. Institutions returning their unused funds will be reimbursed from the 1962 fiscal year budget. This transfer of funds to institutions ready to use them will result in ground-breaking for several new research buildings this spring which otherwise would have been delayed considerably.

### Three New Study Sections Established in Division of Research Grants

Three advisory groups have recently been elevated to study section status in the NIH Division of Research Grants. They are: Accident Prevention; Primate Research; and History of Medicine.



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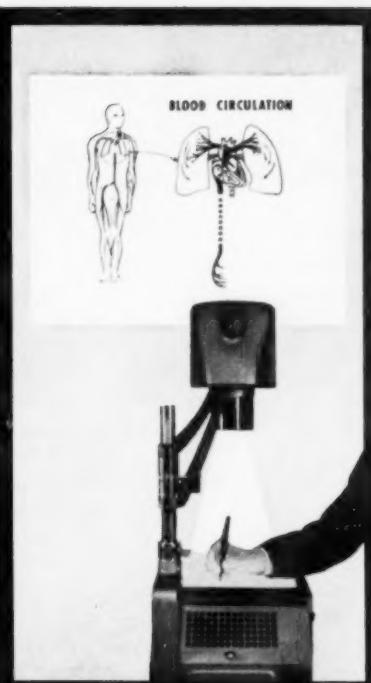
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The addition of these study sections raises the current total of such technical advisory bodies to 39. Their function is to review applications for NIH research grants.

### **Child Research Center Authorized at NIH**

Establishment at NIH of a Center for Research in Child Health as a part of the Division of General Medical Sciences was authorized by PHS Surgeon General Terry on February 17. His action implemented President Kennedy's order of February 8.

The new research center will be added to the present organization structure of DGMS, which now consists of a Research Grants Branch, a Research Training Branch, and a Center for Aging Research.

The responsibilities of the new Center, set forth in an organization and functional statement, were described as follows:

Directing a program aimed at encouraging and stimulating developmental and exploratory research and research training activities in the basic biological, behavioral, and clinical sciences related to the phenomena and health problems of childhood and adolescence;

Strengthening the role of the National Institutes of Health in the multi-disciplinary fields related to child health, growth, and development, both intramurally and extramurally, through consultation and advice to the several categorical Institutes;

Providing a central point for the development, coordination, and dissemination of information concerning the character, status of, and needs for, research and research training in fields related to child health;

Administering broad collaborative research programs and performing national

service center functions in support thereof; and

Sponsoring conferences, symposia, and seminars in matters relating to research and research training in the field of child health.

### **New Booklet Describes Programs of DGMS**

The Division of General Medical Sciences has published a brochure outlining its responsibilities for administering the research and research training grants programs in the basic biochemical sciences, in public health, in certain clinical areas, and in aging.

The 23-page illustrated booklet provides details concerning the Center for Aging Research, the General Clinical Research Center Program, and the grant programs for research and research training in the sciences basic to medicine and biology. As of January, 1961, the booklet reveals DGMS was supporting more than 1,600 research projects throughout the nation, more than 435 research training programs, and approximately 2,000 fellowships.

Single copies of the booklet, entitled, "Division of General Medical Sciences," are available upon request from the DGMS Information Office, NIH, Bethesda 14, Md.

### **New Edition of Clinical Studies Booklet Available**

The Clinical Center of the National Institutes of Health is a modern facility shared by all of the Institutes for combined laboratory and clinical investigation programs. The patient care area is comparable in staff and equipment to those of leading general hospitals, with special provisions for the comfort and welfare of chronic disease patients.

Because the cooperation and assistance of physicians in private practice and those associated with hospitals and clinics

is essential in the selection of patients to participate in the studies conducted in the Clinical Center, and because it is vital that these physicians know in some detail about the work that is being carried on, a booklet providing this information is issued periodically. A new edition of this booklet, "Current Clinical Studies and Patient Referral Procedures" is just off the press. It contains up-to-date information concerning patient referral procedures, eligibility requirements, brief descriptions of the clinical studies under way, and types of patients required for participation in research studies.

Copies of this booklet are mailed regularly to those requesting it, as new editions are issued. Requests should be sent to Jack Masur, M.D., Director, Clinical Center, National Institutes of Health, Bethesda 14, Md.

### **International Research Office Fills Two Top Staff Positions**

Dr. Martin N. Cummings and Robert H. Grant have been designated as chief and assistant chief of the newly established Office of International Research Activities at the National Institutes of Health by Dr. James A. Shannon, NIH director.

The Office of International Health Activities will be responsible for coordinating all operations at NIH bearing upon international research and will be responsible for advising both the Director of NIH and the Surgeon General of the Public Health Service on Medical research affairs with international aspects.

Doctor Cummings is scheduled to assume direction of the new office on July 1. Now chairman of the department of microbiology at the University of Oklahoma, he has in the past headed medical research programs for the Veterans Ad-

ministration and the Public Health Service.

Mr. Grant, for several years executive officer of the National Heart Institute, has during the past year been on leave from that post to serve as Director of the Special Staff on Aging for the Department of Health, Education, and Welfare. A veteran of 19 years as a career Civil Service employee, Mr. Grant received a superior performance award from HEW Secretary Flemming in 1959 for his outstanding accomplishments to research administration.

The Office of International Research Activities will be the focal point of NIH relationships with the World Health Organization, the Pan American Health Organization and other public and private institutions engaged in international research and scientific affairs. The establishment and administration of NIH offices overseas will also be the responsibility of the Office of International Research Activities.

### **New Appointments**

Dr. Samuel M. Fox III, appointed assistant director of the National Heart Institute to succeed Dr. Luther L. Terry, now Surgeon General of the Public Health Service. Dr. Fox has been co-chief of the Section on Cardiodynamics of the Heart Institute, and assistant clinical professor of medicine at Georgetown University School of Medicine and associate director, Cardiopulmonary Research Training Program at the Veterans Hospital, Washington, D.C. . . Dr. Donald S. Fredrickson, appointed clinical director of the National Heart Institute's intramural research program. Dr. Fredrickson, with the Institute since 1953, has been serving as a senior staff member of the Section on Metabolism. . . Richard N. Henschel, named executive officer of the National Heart Institute by Dr. James Watt, Director. Mr. Henschel

has been with NIH since 1947, serving in an executive capacity with the National Cancer Institute, the Clinical Center, and, most recently, as assistant executive officer of NIH. . . . Dr. Margaret H. Sloan, National Blood Program executive and staff director of a recent medical research study for the Senate Appropriations Committee, appointed special assistant to Dr. Kenneth N. Endicott, Director of the National Cancer Institute. . . . Dr. Fritz A. Freyhan, assistant professor of psychiatry at the University of Pennsylvania, appointed deputy chief of the Clinical Neuropharmacology Research Center in charge of clinical studies. Dr. Freyhan assumed his new position February 15, at the Center, which is a joint research facility of the National Institute of Mental Health and St. Elizabeth's Hospital, Washington, D.C. . . . Judson Hardy, appointed chief of the Public Information Section in the Office of Research Information, NIH, effective February 27. He succeeds Clifford F. Johnson, recently named chief of the Office of Research Information. Hardy most recently has served as public affairs officer of the Division of Radiological Health, Public Health Service.

#### **Nutrition Study Section Cosponsors Conference**

An international conference on "Marine Food Resources and World Nutrition," to be held in Washington, D.C. September 17-29, will be cosponsored by the Nutrition Study Section of the NIH Division of Research Grants, the United Nations Food and Agriculture Organization and the Food and Nutrition Board of the National Academy of Sciences.

Main purpose of the meeting is to stimulate research on marine food resources and their utilization. It will bring together for the first time experts in the fields of nutrition and oceanography who will jointly attempt to delineate the basic research requirements necessary for real progress in this field.

#### **Arthritis Institute Observes Tenth Anniversary on March 9**

With a special "Report to the Nation," commemorating 10 years of progress against arthritis and metabolic diseases, the National Institute of Arthritis and Metabolic Diseases on March 9 celebrated its tenth anniversary with a program presented in the NIH Clinical Center auditorium. The program featured addresses by HEW Secretary Abraham A. Ribicoff, PHS Surgeon General Luther L. Terry, Senator Lister Hill, Dr. Ronald W. Lamont-Havers, Medical Director, Arthritis and Rheumatism Foundation. Six prominent authorities in the Institute's categorical fields presented brief reports on progress in research during the past decade.

Presenting the scientific reports were: Dr. Currier McEwen, New York University School of Medicine, "Arthritis Research"; Dr. George W. Thorn, Harvard Medical School, "Diabetes and Endocrine Diseases"; Dr. Franz J. Ingelfinger, Professor of Medicine, Boston University, "Gastroenterology"; Dr. DeWitt Stetten, Jr., Associate Director in Charge of Research, NIAMD, "Metabolic and Molecular Diseases"; and Dr. Arthur Kornberg, Stanford University, former Institute laboratory chief and Nobel prize-winner, "Metabolism and Enzymology."

# OXFORD medical texts

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By Sir Russell Brain, *London Hospital, Oxford University*. Concise, up-to-date and authoritative, this text for the medical student employs a clinical rather than an anatomical approach. The consistent use of the Paris nomenclature gives a high degree of clarity.

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By John C. Nemiah, M.D., *Associate in Psychiatry, Harvard Medical School; Psychiatrist, Massachusetts General Hospital*. An excellent introduction to the basic principles of psychopathology, designed primarily for the medical student. Focus is on the clinical phenomenon itself, with extensive verbatim interview material used to explain psychodynamic principles.

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Revised by C. A. Keele, *Professor of Pharmacology and Therapeutics*, and E. Neil, *Professor of Physiology, Middlesex Hospital Medical School*. Many sections completely rewritten, a more readable format, and the whole brought fully up-to-date. This new tenth edition is easier to use and yet maintains the same authoritative standards as its predecessor. A chapter on the special senses is an added feature.

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By Russell T. Woodburne, Ph.D., *Chairman, Department of Anatomy, University of Michigan Medical School*. Nine new four-color plates with tissue overlays supplying anatomical labeling. Paris nomenclature including the 1960 New York revisions, and a wealth of illustrations constitute some of the outstanding features of this new edition. Organization is along regional lines, with attention focused on the systematic continuities within the regions.

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## Items of Current Interest

### Schedule Summer Seminar on Medical Teaching

The fourth annual Summer Seminar on Medical Teaching, sponsored by the Association of American Medical Colleges, will again this year be held in Chicago. The Shoreland Hotel on the south shore of Lake Michigan near the University of Chicago campus will be the site of the conference from June 11-17.

The meeting will provide an opportunity for medical teachers to join the specially qualified educationists of earlier conferences in an examination of teaching and learning in medical schools. Included in the presentations, demonstrations, and discussions will be such topics as the nature of learning; the nature of medical students and faculties; the use of the familiar lecture and laboratory, ward exercise and clinical conference as well as less familiar methods of instruction; the development and use of tests and other appraisal devices for measuring student performance in medical school.

Attendance at this meeting will be limited. Further inquiry regarding participation should be directed to Dr. Ward Darley, Association of American Medical Colleges, 2530 Ridge Ave., Evanston, Ill.

### Canada to Have New Medical School

The University of Sherbrooke, Quebec, Canada, has decided to establish a Faculty of Medicine with Dr. Gerard Luderger Larouche as dean it was announced recently by Msgr. Irene Pinard, rector of the university.

According to proposed plans, the faculty should be in operation by 1962 or 1963, and will have the collaboration of three general hospitals as well as a chronic treatment hospital, a sanatorium, and a mental hospital now under construction. There will probably be ten full-time teachers on the staff and about 60 students when the school first opens.

Once a faculty of medicine is established the university is hoping to encourage the development of related medical fields such as nursing schools, medical technology, physiotherapy, and rehabilitation.

### Lederle Research Fellowships Available

The Lederle Laboratories Division of the American Cyanamid Company announces that it is making available to medical schools throughout the United States and Canada "Lederle Medical Student Research Fellowships" for the year 1961. These fellowships are intended to relieve in part the financial burden of students who desire to devote their summer vacations to research in the pre-clinical departments. The selection of students to receive such awards will be made by the dean of the medical school, or by the regularly constituted committee of the faculty charged with such selections. Further information may be obtained by writing to Lederle Laboratories, Pearl River, N.Y.

### Medical School Faculties Aided by Markle Fund Grants

Twenty-five young medical scientists, all faculty members of medical schools in

the United States and Canada, have been appointed Markle Scholars in Medical Science by the John and Mary R. Markle Foundation of New York. For the first time since 1948, when these annual appointments were begun, a woman physician has been selected. She is Dr. Mary Ellen Avery, assistant professor of pediatrics at Johns Hopkins University School of Medicine.

The purpose of the program is to help relieve the faculty shortage in medical schools by giving young teachers and investigators academic security and financial assistance early in their careers. Appropriations totalling \$750,000 have been made to the 25 schools where the Scholars whose grants begin July 1, 1961, will work. Each school will receive \$30,000 at the rate of \$6,000 a year for the next five years, toward support of the Scholar and his research.

#### **Massachusetts Educator to Supervise Medical Survey**

The appointment of Dr. Edward P. Parkin to supervise a medical survey for the Committee on Institutional Cooperation was announced recently by Dr. John Hicks, director.

On leave of absence from his position as professor of bacteriology and public health at the University of Massachusetts, Dr. Larkin will be responsible for a study of medical education in the Midwest under the auspices of the CIC which represents the following 11 universities: Chicago, Illinois, Indiana, Iowa,

Michigan, Michigan State, Minnesota, Northwestern, Ohio State, Purdue, and Wisconsin. All of the institutions, except Purdue and Michigan State, have schools of medicine.

Dr. Larkin holds a Ph.D. in bacteriology and related sciences, and in addition to his 11 years of college teaching, he has also been visiting lecturer at various hospitals and schools of nursing.

Studies of the Committee on Institutional Cooperation are financed by the Carnegie Corporation of New York.

#### **Army Establishes New Medical Research Unit in Thailand**

The Army Medical Service has collaborated in establishing a new medical research unit in Bangkok, Thailand, according to the Army Surgeon General's office. The laboratory has been set up as the U. S. Component of the SEATO Medical Research Project to conduct a continuing research program on infectious diseases.

The U. S. Component will be directed by Lt. Col. Oscar Felsenfeld, Medical Corps. His staff will eventually consist of about 15 scientific and medical personnel.

The first research lab of its kind to be set up by the U.S. in Thailand, the new unit is an outgrowth of research efforts by various U.S. government agencies at the request of the Thai government during the 1958 cholera epidemic in Thailand.

## PERSONNEL EXCHANGE

### Faculty Vacancies

**PHYSIOLOGIST:** Applications are invited for the position of Assistant Professor of Physiology, salary dependent on qualifications, \$6,000 minimum. Preference will be given to applicant with special knowledge of biophysics. Opportunity for research. Teaching duties not excessive. Apply to Dr. C. B. Weld, Head, Department of Physiology, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada.

**MEDICAL EDUCATION CO-ORDINATOR:** Thoroughly progressive midwestern private general hospital seeks a full-time M.D. possessing extraordinary knowledge of the basic sciences, disease entities, teaching responsibilities plus capacity to utilize qualified members of present staff. Must have experience of teaching principles as applied to intern and resident programs in hospitals, university medical schools or non-university teaching hospitals. Address: V-107.

**PREVENTIVE MEDICINE:** Full-time appointment, with epidemiologic orientation desired for teaching program with opportunities for research participation and development. Some background in public health or community organization desirable. Interest in teaching should be primary. Rank and salary based on qualifications and ability. Address, Jonas N. Muller, M.D., Chairman, Department of Preventive Medicine, New York Medical College, Fifth Avenue at 106th Street, New York 29, N. Y.

**CLINICIANS-MEDICAL EDUCATORS:** Short term visiting clinical faculty needed by U.S. Midwestern school of medicine to serve as lecturers at overseas postgraduate medical sciences institute, and to lecture on tour of medical colleges and hospitals of this Middle Eastern country. University Contract-U.S. Technical Aid Program. Need for clinical professors in various fields, well-oriented in basic medical sciences. Mature years and teaching experience essential. Appointment for any three-month period beginning February, 1961 through May, 1962, exclusive of June, July, August. Salary, cost of travel by air, and limited allowances. Address: V-108.

**PATHOLOGISTS-TRAINING OR STAFF POSITIONS:** Expanding Medical Center, new physical plant. Opportunities for future academic, service, or research positions. Reasonable stipends based on individual qualifications. Contact Dr. E. G. Stuart,

West Virginia University Medical Center, Morgantown, West Va.

**PHARMACOLOGIST:** Positions open on medical school faculty for July 1, 1961. Rank of instructor or assistant professor, depending on qualifications. Teaching responsibilities limited to nursing students and small medical classes. Active graduate training program. Facilities available for independent research program. Address: Dr. Frank C. Ferguson, Jr., Dept. of Pharmacology, Albany Medical College, Albany 8, N. Y.

**PHYSIATRIST:** To assume direction of department of physical medicine and rehabilitation of Mount Sinai Hospital, with teaching responsibilities at affiliated Chicago Medical School. Affiliated with Rest Haven Rehabilitation Hospital. Will also be consultant to affiliated Homes for the Aged. Challenging opportunity for a Board Qualified or Board Eligible Physiatrist interested in developing a complete program including a residency in P M & R. Apply: Director, Mount Sinai Hospital, Chicago 8, Ill.

**PSYCHIATRIST:** Faculty appointment in medical school for psychiatrist, preferably with experience since residency. Must be interested in clinical teaching of residents and students. Time available for own treatment of inpatients or outpatients, also for research. Laboratories available, also personal and didactic analyses and opportunities for full psychoanalytic training locally. Unique opportunity to join an active and established department with unlimited opportunities. Salary competitive. Address: V-109.

**MEDICAL EDUCATOR-PREVENTIVE MEDICINE:** Full-time appointment, at associate, or full professorial level depending upon qualifications and ability, to head up an established, ongoing, department of postgraduate education with opportunities for teaching and research participation and development in the department of preventive medicine of a university medical school. Some background in preventive medicine or administrative medicine is desirable. Salary around \$14,000 plus fringe benefits. Address: V-110.

**OBSTETRICIAN-GYNECOLOGIST:** Board eligible or Board certified obstetrician-gynecologist for full-time assistant or associate professorship in well established university department. Salary based on training and experience. Modern physical plant with research building. Adequate clinical material and opportunity to develop areas of personal interest. Send curriculum vitae. Address: V-111.

To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.

### Personnel Available

**SURGEON:** Age 34, M.B., B.S. (Univ. of London), F.R.C.S. (England). Wide experience in general surgery and teaching. Eight years postgraduate training in teaching hospitals, including one year in basic science and research and one year as surgical resident in Canadian teaching hospital. Seeks full-time surgical appointment in U.S. medical school. Address: A-472.

**PEDIATRIC CARDIOLOGIST:** Age 39, qualified for examination by American Board of Pediatric Cardiology. Now full-time, desires half-time university appointment. Catheterization laboratory necessary. Address: A-474.

**MEDICAL ADMINISTRATOR:** Harvard trained, Ph.D. Seeking position as medical school administrator-graduate school Dean. Board experience in administration, teaching, research and writing. Author and co-editor of several well-known medical books. Vast experience in basic subjects and clinical subjects at Harvard and Harvard hospitals. Numerous publications. Address: A-475.

**PHYSICIAN-PHYSIOLOGIST:** M.D., Ph.D. Age 50. Extensive experience in cardiopulmonary research, clinical and laboratory; teaching and administration; numerous publications; research grants. Desires position with responsibility to develop research and teaching program. Address: A-476.

**PHYSICIAN:** M.D., D.P.H. Extensive experience in epidemiological research, teaching and administration in academic and health department settings. Published articles; book in preparation. Seeks senior university appointment offering opportunities in broad field of preventive medicine. Address: A-477.

**INTERNIST:** M.D., Ph.D. Currently Assistant Professor of Medicine with administrative and teaching responsibility for attending and house staff and medical students on large medical service. Active, well-supported, independent research program. Training includes NIH and the University of Chicago. Numerous publications. Desires geographic full-time position or equivalent in medical school or affiliated hospital with facilities for expanding both clinical and

laboratory aspects of research program. Address: A-478.

**INTERNIST:** Certified; also certified in cardiovascular disease. Experience in medical school teaching as assistant professor at student, intern, resident and practicing physician level. Desires full-time position in teaching or community hospital and/or medical school. Address: A-479.

**INTERNIST-CARDIOLOGIST:** Board certified. Age 35. One year training in clinical cardiology and one year in cardiovascular laboratory—Harvard and Mayo Clinic. Now university instructor in England, returning shortly to U.S. Interested in practice, teaching, director of medical education. Address: A-480.

**PATHOLOGIST:** Age 56. Voluntarily retiring as professor and department head, University Medical Center, July 1, 1961. Twenty years teaching experience. Thoroughly experienced in service work. Desires position as teacher combined with service work, preferably surgical pathology. Address: A-481.

**PATHOLOGIST — ADMINISTRATOR:** Pathologist with excellent full-time academic background in administration, medical education, research and service responsibilities. Experience includes professorship and chairman department of pathology, development of research, curriculum, teaching methods, services, and coordinated medical school activities. Extensive publications. Desires teaching position with opportunity to aid in development. Eastern location preferred. Address: A-482.

**INTERNIST:** Certified. Age 35. Currently on faculty of Eastern medical school. Experience in private practice and administrative medicine. Desires appointment in teaching hospital and/or medical school with opportunities for clinical research in cardiovascular disease, teaching and administrative responsibilities. Address: A-483.

**PSYCHIATRIC SOCIAL WORKER:** Female, M.S., personal psychoanalysis. Three years experience in delinquency problems. Current appointment in medical school involves participation in clinical and teaching program in department of psychiatry. Desires similar position or other psychiatric clinical appointment. Southern California preferred. Available July 1, 1961. Address: A-484.

**INTERNIST:** Age 34, single, male. Currently on faculty of British Colonial medical school. Postgraduate training in clinical medicine and research. Experience in cardiac catheterisation and haemodynamic investigations; also in life insurance medicine and some private consultative practice. Numerous publications. Desires faculty appointment or fellowship with opportunity for cardiological investigation. Address: A-485.

**OBSTETRICIAN-GYNECOLOGIST:** Age 35, PBK. AOA. Desires head administrative appointment in medical school or affiliated hospital, with opportunity to develop department. Ability in creative research, teaching, and operative gynecology. Institution must allow to be earned or pay a minimum of \$30,000. Address: A-486.

**SURGEON-THORACIC:** Age 34. Currently engaged in thoracic surgery residency training which includes all phases of pulmonary resectional surgery. Wide experience in heart surgery. Desires full-time medical school appointment, balanced between teaching, research, and dog laboratory research. Address: A-487.

**MICROBIOLOGIST:** Ph.D. Many years experience in clinical bacteriology and mycology. Excellent background in parasitology and virology. Well qualified in many phases of public health microbiology. Medical school and A.S.C.P. teaching experience as well as administrative responsibilities. Publications. Desires challenging appointment in medical school. Address: A-488.

**ANATOMIST:** Ph.D. Male, age 43. Fifteen years teaching experience. Currently assistant professor teaching neuroanatomy and gross anatomy in school of medicine and dental medicine. Also experienced in histology and physiology. Trained in educational methods and testing. Desires opportunity for teaching and research in anatomy department or in a correlated pre-clinical medical program. Address: A-489.

**OBSTETRICIAN-GYNECOLOGIST:** M. B. B. S., India, F.R.C.S. Canada, university trained in U.S., immigrant to U.S. Desires teaching position, department of obstetrics and gynecology of a hospital with active educational program. Address: A-490.

**MEDICAL PHOTOGRAPHER:** A.B., age 35. Ten years experience in medical photography (including 7 years with Veterans Administration). Special training in photomicrography. Fluent knowledge of German. Desires position with medical school and/or hospital affiliated with medical school. Good references. Resumé and references on request. Address: A-491.

**PHYSIOLOGIST-PHARMACOLOGIST:** M.D., age 31. Desires research position in the fields of neurophysiology or neuropharmacology. At present postdoctoral fellow in Eastern medical school. Address: A-492.

**PHYSIOLOGIST:** Ph.D., assistant professor. Long-term research program with staff of four based on continuing large NIH grants. Basic and clinical aspects of endocrine physiology. Major physiology teaching responsibilities and experience. Seeks associate professorship in physiology. Address: A-493.

**PHARMACOLOGIST:** M.D., Punjab University, India. Age 27, married, one child. Publications, *Ind. J. Med. Sc.* and *J. Am. Pharm. Assn.* Presently research assistant, department of pharmacology, University of Agra. Desires position with U.S. medical school with opportunity for post-doctoral study. Address: A-494.

**PSYCHIATRIC SOCIAL WORKER:** M.A., University of Chicago School of Social Service Administration. Desires position as teacher of psychiatric social work to medical students. Twelve years experience as chief psychiatric social worker in two medical schools. Address: A-495.

**BIOPHYSICIST - PHYSIOLOGIST:** Ph.D., MS EE, wishes faculty appointment, teaching and research. Publications, books. Areas of research interest — bioelectric studies, origins of congenital heart disease, biomedical engineering. Address: A-496.

**PHYSIOLOGIST-PHARMACOLOGIST:** Ph.D., faculty member of medical school. Teaching experience. Research in endocrine physiology and pharmacology of endocrine preparations. Publications and Society memberships. Desires teaching and/or research position with opportunity for independent research. Address: A-497.

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1. Clin. N. W.; Pediat. Clin. North America, Nov., 1954, pp. 949-962.

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